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Smithsonian

Debussy in the desert:
singers perform duet
at Santa Fe Opera (p.100)

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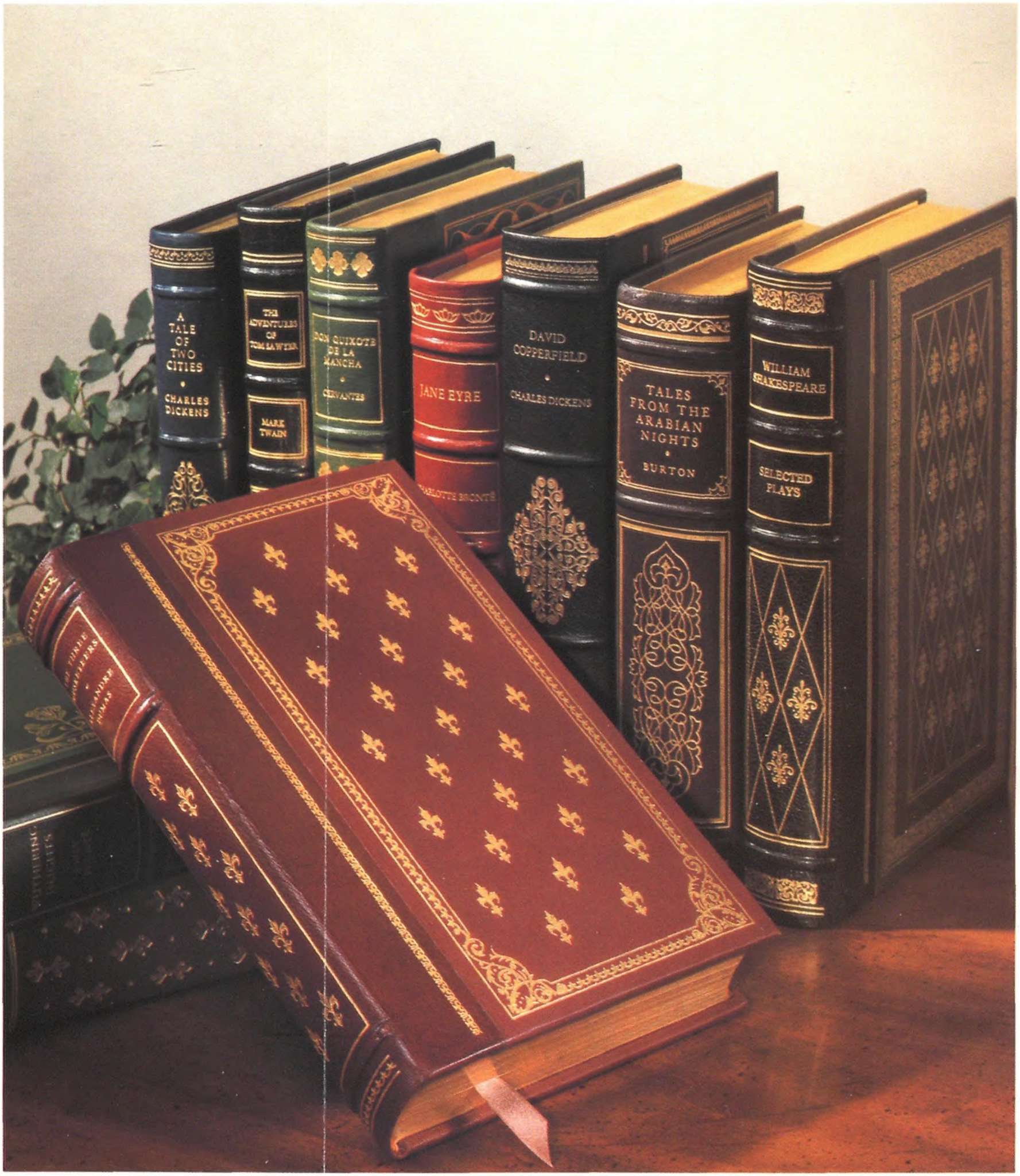

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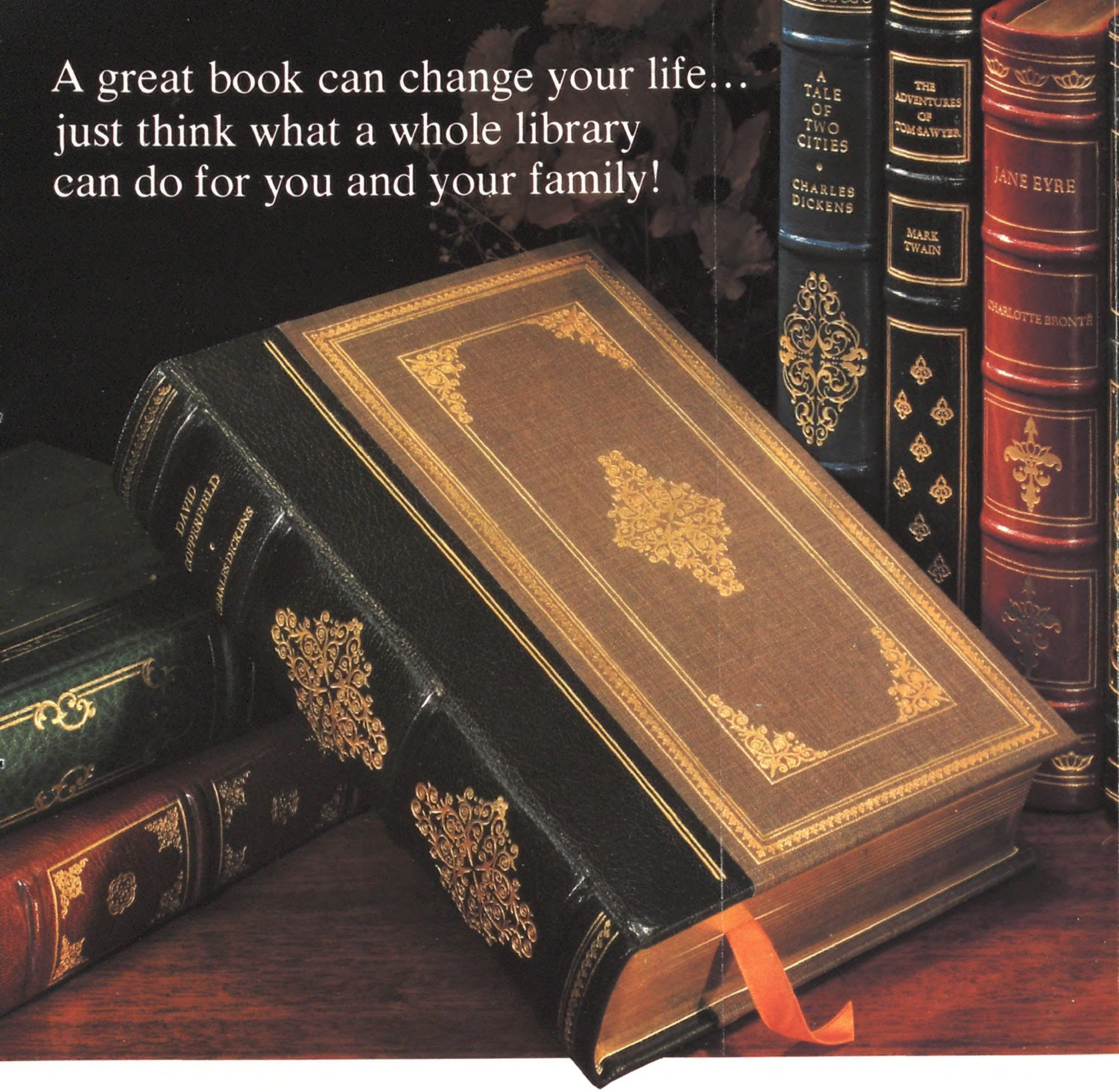

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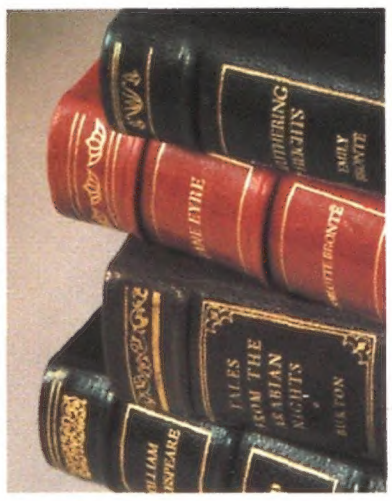

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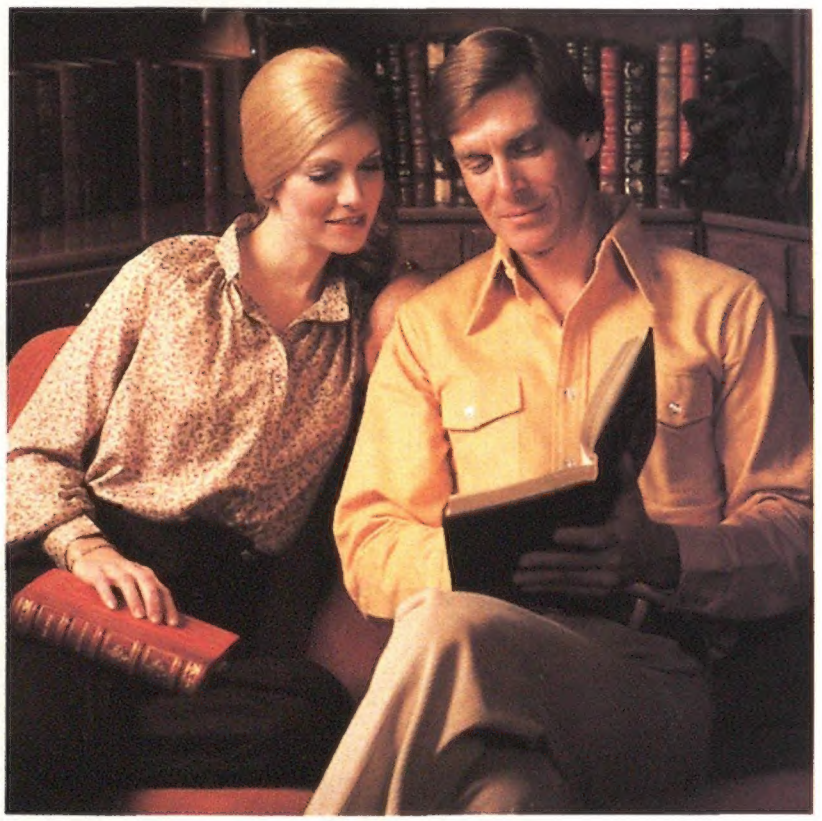

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Volume 12, Number 5

Table of Contents

COVER: Under desert skies at the Santa Fe opera, young singers perform a duet from Debussy's impressionist opera, *Pelléas et Mélisande* (p. 100)
Photograph by David Stein

6 The view from the castle: Secretary Ripley's comments

10 Letters to the Editor

16 Around the Mall and beyond by Edwards Park

22 Phenomena, comment and notes by John P. Wiley jr.

30 Thanks to the Settlement Act and a 44-million-acre land switch, Alaska's natives are bringing off a giant corporate takeover—for better or worse
By Michael Parfit

40 At New York State's old Saratoga racing complex the horseplayers (swells and others) mix with history
Article by Whitney Tower, photographs by Richard Howard

50 William Edmondson's art: he carved pure, strong and everlasting monuments in stone
By Louise LeQuire, color photographs by Dan Carraco

60 Allan Pinkerton's detectives almost always got their man
By Frederick S. Voss and James G. Barber

78 As they roam their last remaining strongholds in the West, grizzly bears sometimes clash with Man
By Robert C. Gildart

90 After 340 years, Galileo may beat the Inquisition
By Israel Shenker

100 Santa Fe, where the Rocky Mountains and clear Western skies help to make opera magic
Article by James Idema, photographs by David Stein

109 Trying to stay cool, once again, may be a mechanical breeze, thanks to the electric fan
By Benjamin W. Lawless

122 Book reviews

130 Picture credits

134 Additional reading

136 August events at the Smithsonian

142 Smithsonian tours

144 Bye-bye, Mom's apple pie; now chili is in
By William Weber Johnson

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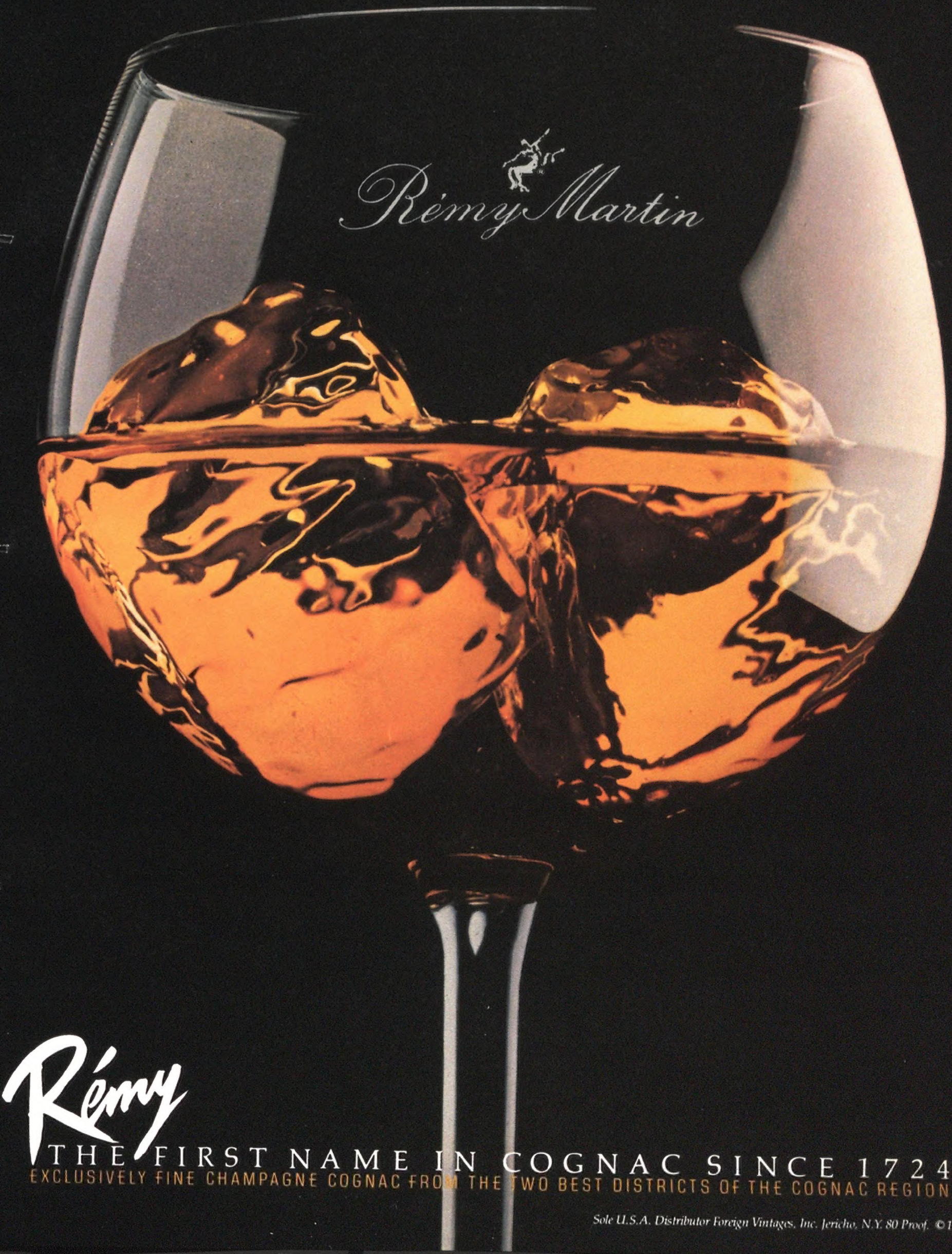

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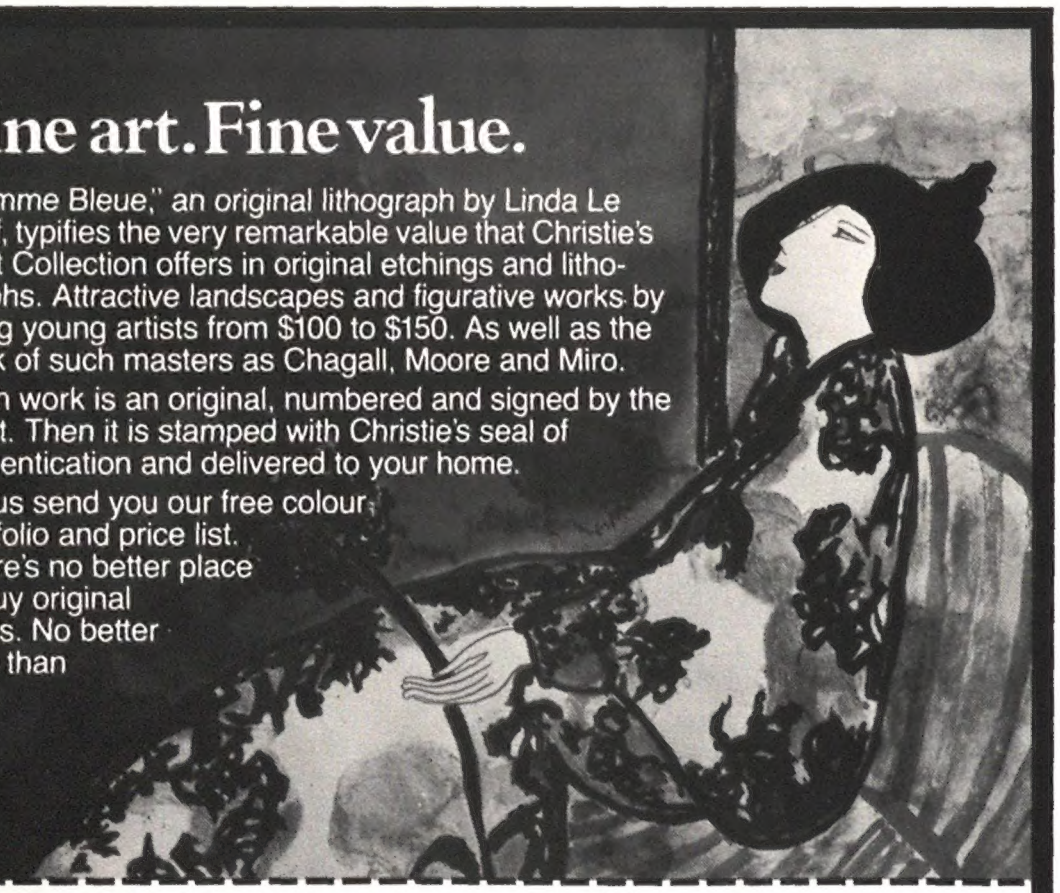

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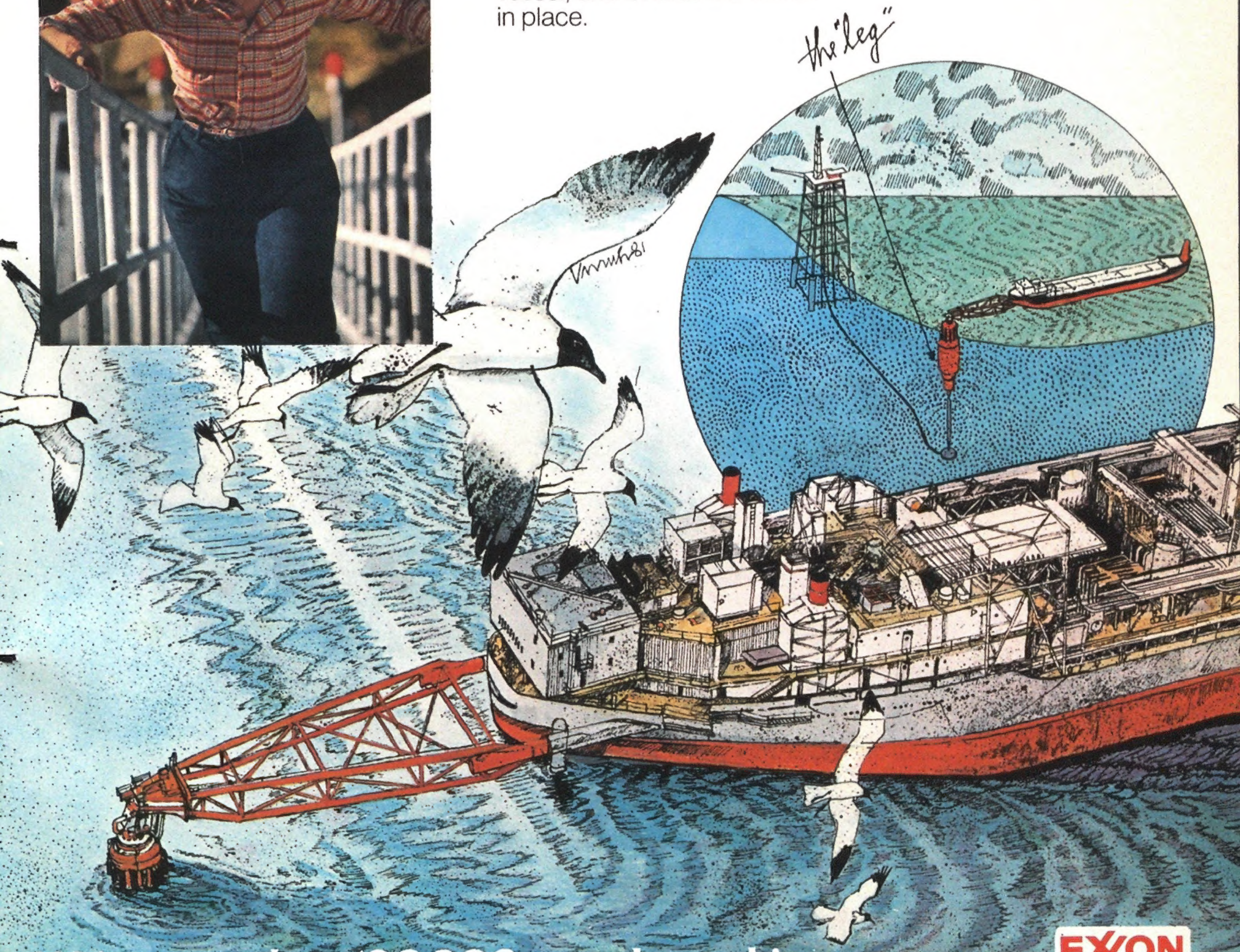

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Secretary Ripley's comments

The view from the castle

In times of world tensions, our American scholarly centers abroad keep vital human channels open

Despite nearly half a century (since World War II) of deep involvement in the affairs of the rest of the world, it would seem that we as Americans still have only a limited understanding of our fate as citizens of all of the Earth.

Yet there are cultural resources which, if properly supported, can increase our capacity to understand other societies. The network for these resources has at least three parts. Most of us are aware of academic exchange programs, such as the Fulbright scholarships; we may also know of, or can imagine, foreign study centers on U.S. campuses. But the third part of the network is a powerful instrument known to relatively few: American scholarly centers abroad.

Our major overseas research centers number a dozen or so, circle the globe and enable U.S. scholars to work on projects as diverse as archaeology in Jordan, ecosystems in the Galápagos Islands and the cultural revolution in China.

The Smithsonian has a record of support for several of these—in Egypt, Papua New Guinea, Greece and India, to name a few. U.S. government support has come in recent years from the National Endowment for the Humanities and the U.S. International Communication Agency. Centers in India and Cairo have also been the fortunate recipients of rupees and Egyptian pounds through sales of surplus U.S. agricultural commodities (mostly wheat) in exchange for local currencies. When such currencies exceed the normal embassy use, they become available for intellectual and scientific purposes. But these funds are drying up.

A case in point is the American Research Center in Egypt, based in Cairo, which no longer will have access to such funds. The center, over the years, has been of inestimable value in promoting mutual understanding between our two countries, especially in times of stress. When diplomatic relations between the United States and Egypt were broken during the 1967 war, the flow of American scholars to the Cairo center continued without interruption.

Very few foundations are now making any grants to international programs. If foundations fail, what about the support of the other major donor in the private sector, the corporations? We are encouraged by the initial corporate response to the American Center of Oriental Research, which hopes to construct a new building in Amman, on property donated by the Hashemite Kingdom of Jordan. The Amman center's programs in archaeology and Islamic art are of compelling interest to the Smithsonian and to a number of U.S. and multinational corporations. Unhappily, not all the centers are in areas where corporate interest and American scholarship flow in the same direction.

At this moment in history when uncertainty reigns supreme, a deeper commitment to the interplay of international understanding is critical. A powerful voice in such mutuality and respect is that of our scholarly centers abroad. We of this Institution, after 135 years of such connections, feel the United States would be derelict indeed to neglect such an inexpensive, unassuming but effective line of defense against international ignorance and the consequent growth of tensions and hostility.

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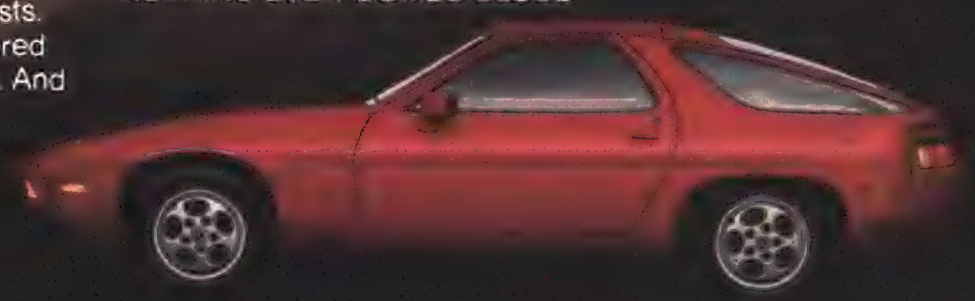

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Letters to the Editor

Bobcats

Dear Sir: Regarding Hope Ryden's June article, my husband and I saw our bobcat 20 years ago on a lonely mountain road in Catron County, New Mexico, standing boldly in the center of the highway. Powerful, intelligent, regal, he studied us as our car slowed and came to a halt, then trotted calmly across the road, swung around and looked at us again. When we described the encounter to a friend, it became obvious that not everyone shared our wonder and delight. "Why," queried our friend, "didn't you shoot him?"

Helen Ingraham Francis
Kensington, Maryland

Dear Sir: Contrary to author Ryden's intimations, the bobcat is widely distributed across most of the country and, in the nearly unanimous opinion of the wildlife professionals who have studied the matter, is not jeopardized by international trade. This judgment rests not only on the bobcat's abundance in large areas of the country, but also on the scientific management programs and protections being successfully implemented by professional wildlife managers who staff our state wildlife agencies.

By focusing on restrictions on trapping and hunting, Hope Ryden diverts the attention of her readers from the very real concern of maintaining the authority and capability to manage wildlife and the increasing and crucial problem of habitat destruction. State wildlife agencies can and will adequately protect the bobcat and other wildlife from excessive harvest, but only a broad base of public support can preserve the habitat of the bobcat and other wild species from threatening forces in a modern society.

Jack H. Berryman
International Association of Fish and Wildlife Agencies
Washington, D.C.

As the article states, the U.S. Court of Appeals ruled that biological standards used to authorize bobcat exports were "inadequate" and "should be set aside." The case has been remanded to the lower court with instructions to favor protection of the animal where doubt exists. Ed.

Dear Sir: On an Ojai mountain trail one April morning in 1980 our four horses halted on a sandy ridge at a sudden, piercing screech from the sage. A wobbly, half-blind, bone-thin bobcat kitten with matted fur planted itself beside the first pair of hooves it came to.

The two-week-old infant cried so pitifully my husband reached down and picked it up. We carried all 11 ounces of Morning Star home and fed her warm milk from a bottle, deciding to set her free when weaned. But now, 16 months old, she has remained a constant and adored companion of our horses, cats, husky and ourselves—coming and going freely into the adjacent hills.

She is totally free and totally domesticated, remaining her feisty bobcat self, growling at cat boxes, flea collars, hands that try to pet when she doesn't want to be touched, anything that comes within five feet of her dish of kidneys. She loves the tall grass of our unkempt backyard, yet when we open the door leaps to our shoulders, in the middle of the night lands on our bed, and walks across our faces when time to get up—but has never sunk claws or teeth into human flesh.

Liz Cain
Oak View, California

San Diego Air Museum

Dear Sir: Your article brought back memories of my first thrilling plane ride. In 1927 a friend and I, 13-year-old lightweights, were ballast in a series of flights over Carbondale, Illinois. The pilot was Reggie Robbins of Houston and the plane an L-S-5. Then, in the late 1960s, I read in the *Tulsa World* of a dedicated priest whose hobby was finding those old jewels and, with spit and wire, making them fly. My letter to him appeared in

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the *World* and in no time Reggie Robbins wrote me from Houston!

He remembered us and sent me three photos of the old plane. He was my first hero, a far finer hero than Valentino.

Katie Neatherry
Springdale, Arkansas

Computer visions

Dear Sir: C. R. Barnett claims that "words just aren't quite enough" to describe the universe coming into being. May I suggest some words that are far more satisfactory than the computer graphics shown (which look like images from a broken TV set): The Heavenly Host in Milton's *Paradise Lost*—"They viewed the vast immeasurable abyss/Outrageous as a sea, dark, wasteful, wild,/Up from the bottom turned by furious winds/And surging waves, as mountains to assault/Heav'n's highth, and with the center mix the pole. . . ."

David H. Stewart
College Station, Texas

Dear Sir: In your grid diagram you have labeled the horizontal axis "Y" and the vertical axis "X." This is incorrect.

Roseanne M. Sittler
Albuquerque, New Mexico

As described in the article, opposite the diagram, the "X" marks the horizontal line across center, the "Y" vertical. Ed.

Creative Anachronism

Dear Sir: Too often the Society for Creative Anachronism has been made to appear a refuge of fantasy for people whose lives are too dull to bear. Jack Fincher's article more accurately portrayed it as a group of young people willing to take the trouble to re-create appearances and crafts of the Middle Ages. Making a shield that will stand up in battle—much less a suit of armor—is a lot of work. And much practice and physical conditioning is necessary to survive an SCA war.

Barbara Egbert
Carson City, Nevada

Dear Sir: Though my own persona is peaceable, I have penned the following precedents upholding the right of SCA women to give and take blows in honorable battle: "Where is Boadicea's spear/That taught the Roman troops to dance?/Where's Bradamanta without fear,/Armed

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with shield and shining lance,/ Lady paladin of France? . . ./ Where is Wanda, Poland's Queen,/ Who walloped haughty Rutiger?/ Where is Maeve of Erin green?/ (Not even Erin's King could tame her!)/And Bess, who watched for Spain in armor,/ And Aquitania's Eleanor,/ Who rode as chivalrous crusader/ Where are the fighting dames of yore?"

Bard Polifonix of Armorica
(née *Phyllis Ann Karr*)
Rice Lake, Wisconsin

World Bank

Dear Sir: I don't know much about sheep, but I do know they are difficult to herd. How, then—in the name of all that's woolly—are the Syrian sheep in your photograph [see below] driven into and maintained in the fascinating serpentine for milking? How made to alternate, to

put their heads so close together? Aren't they violating each other's space, swapping lanolin in enforced intimacy?

Elizabeth Abbot Langhorne
Lowesville, Virginia

Late in the day, when sheep have been fed and are docile, Bedouin shepherds nudge and talk them into position, linking them with long ropes passed alternately over and under their necks so the women, working down each side of the line, can milk. The sheep seem grateful. Baaa. Ed.

William Walker

Dear Sir: Contrary to your article, William Walker's grave is marked and is located in the very center of the cemetery in Trujillo, Honduras. Until the United Fruit Company left Trujillo in the 1940s Walker's grave was well tended. If you wish to see it today, most of the friendly people of Trujillo will gladly guide you to the grave of *El Gringo* Walker—cutting a path through the weeds to boot.

Edward Marasciulo
Bethesda, Maryland

Chautauqua

Dear: Sir: What an instant pang of homesickness! As a child I took a trip to Chautauqua with an aunt and learned that the *William Tell* overture was not written for the Lone Ranger. I attended my first opera, and later, as a Girl Scout at Camp Newatah across the lake, I often visited Chautauqua by rowboat.

Winifred Flood Crnkovich
Cottonwood, Arizona

Dear Sir: Can't you tell the story of the "tent" Chautauqua that brought culture to thousands of towns and cities all over the United States and Canada? From its beginning in 1874 over many decades, the tent Chautauqua drew an audience in far greater numbers than were drawn to Lake Chautauqua. The first one I attended was in Oskaloosa, Iowa.

Ten days of lectures and music were topped by such luminaries as William Jennings Bryan and opera star Rosa Ponselle. Our family drove there in our Model T 13 miles twice daily—we had to go home to do the milking. Perhaps my most impressive Chautauqua experience was meeting Judge Kenesaw Mountain Landis, famous for having fined Standard Oil $29 million—and also as Commissioner of baseball from 1921 to 1944.

Don Hayworth
Washington, D.C.

Dear Sir: Tent Chautauqua, visiting my little town in Maine, was very much a part of my youth in the 1920s. My most vivid recollection is of an artist who made a charcoal sketch of Satan with one hand, Jesus with the other, and gave a lecture on the Creation, all simultaneously.

LeRoy A. Nile
Greenville, South Carolina

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Around the Mall and beyond

Walking past an exhibit in the Museum of American History recently, I noticed an ancient, wizened balloon still clinging stubbornly to the ceiling. It rotated fitfully with the swirl of air from passing tourists, and I saw writing on it: "Happy Birthday John Bull."

John Bull is the little steam locomotive that sits on a short stretch of track on the ground floor of the museum. It points the way toward the Hall of Transportation. And John Bull, this year, is 150 years old—the oldest operable steam locomotive in the world. It was built by the Stephenson shop in England in 1831, shipped to the United States and put to work on the Camden and Amboy Railroad in New Jersey, which the engineering genius Robert L. Stevens (SMITHSONIAN, October 1979) was building as part of the line between New York and Philadelphia. That railroad, and this wonderful old machine that ran upon it, may be said to have started the age of mechanical transportation in the United States.

But what about that word "operable"? Well, the fact is that next month, on the 150th anniversary of its first trial run after arriving in this country, John Bull will get up steam and go chuffing along a stretch of track beside the Potomac River. And how do we know that the old engine can still do its stuff? Because—aha! now it can be told!—last year it was quietly and gloriously tried out, first right at its display site, then on a couple of miles of track in the Virginia horse country. I know, because I was there. I even got to run the old fellow for a few memorable minutes.

To understand what happened you have to understand the Curator of Transportation, John H. White. Curators, generally speaking, are gentlemen (or ladies) and scholars. John White goes a little further. When it comes to steam locomotives, he is an addict, trembly of hand, afire with passion. He admits that years ago, when he was a mere museum aide, his unbridled desire to fondle old John Bull, then gently fossilizing on a museum floor, led him to slip past the guards on an evening when he had been working late, to mount the gloomy cab, wiggle the controls and finally to ding the old bell. Its clang woke every ghost in the Smithsonian, but presumably did not bring the guards in time, for White managed to scuttle away in the shadows, unseen.

This, then, is a remarkable curator whose love affair with his charges—certainly with this particular one—leads him into new dimensions of insight. Pondering a proper way to mark John Bull's 150th birthday, White called upon his colleague, John Stine, the same engineering wizard who played a vital role in raising the steamship *Indiana* from the bottom of Lake Superior (see this column for January 1980). Working before and after the hours of museum visitation, the two operated on John Bull, dissecting it, reaming out various vital organs, lubricating, tightening and finally sewing the patient back up.

Early on a winter morning, long before the first sightseer arrived, White, Stine and coconspirator Larry Jones hooked an air hose into the engine's arterial system, connected the museum's compressor and let air into the boiler. Pressure rose to 42 pounds per square inch and the safety valve creaked open. There were a few minor leaks—nothing severe.

The crew produced jacks and blocks and clicked the ancient drive wheels clear of their little strand of track. Then White opened the throttle.

John Bull awoke with a mighty cough that blasted decades of dust and possibly a few carefully tossed pennies out of its towering smoke stack. The wheels spun on their jacks, and John White reports that he was afraid for a moment that the old engine would break loose, charge into the rotunda and send the Foucault Pendulum into a new orbit. Flushed with success, the conspirators closed down and cleaned up before the first school group of the morning could catch them playing with their train. But John Bull had revealed a great secret: it may have looked

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like an innocent museum display, but it still lived. It was ready to go.

On a bright October day it went. Various interested staff members were invited to a deserted length of track on the Calverton (Virginia) branch of the Southern Railway to see if John Bull and John White and John Stine—and a number of others with different first names—could perform with fire and steam.

The engine had been carefully inspected and certain repairs made which would not affect it as a museum display. The crew had spent the night beside it. They had tried getting steam up and had blown a gasket. By the time I arrived, this had been replaced, and now the boiler was "cooking."

Firewood had been purchased, but everyone scoured around for some more. Coffee was served in plastic cups. People talked quietly as if afraid of disturbing John Bull at work. Ticks and hisses came from its innards. The pressure gauge showed 30 pounds. There was a blast from the blower (whatever that is) and flames peeked around the firebox door.

At about 10 o'clock the train whistle sounded—a sharp, clear, high-pitched note, straight out of 1831. The bell began to ring. White and Stine reported 50 pounds of pressure, and grasped the controls. "All set?" asked one. "I hope so," replied the other.

And suddenly, unbelievably, the drive wheels rolled. A chug from the smoke-

John Bull gets ready to run.

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stack sent a shower of dirty hot water over everyone. No one cared. It was like that standard scene from old oil-drilling movies when the gusher comes in, and everyone is happily drenched. A great cheer went up, and John Bull moved out.

We trotted along beside the engine. It coasted to a halt. "Will it go in reverse?" someone asked. "I hope so," someone answered. "Otherwise we're in for a hell of a time."

It did go into reverse. It backed up to the "Y" in the tracks where it had started. It moved forward again to negotiate the turn onto the main track. Finally, it headed off on a two-mile jaunt to the little old station of Casanova, surrounded by beautiful old homes and horse paddocks. When it came to a highway crossing, people had to get out to flag down traffic. We wondered if it gave truck drivers culture shock. Probably not. We put pennies on the track. Someone pointed out that we'd better put them down evenly, one on each side, otherwise we might derail the engine.

In the afternoon, John White let me drive John Bull. The throttle lever, a long, wobbly iron rod, turned very stiffly. But the wheels moved gently, without a jerk. The little cab swung beneath my feet. The Virginia countryside drifted past at 15 miles an hour. A beautiful day.

Last August—that's a year ago—I noted that our farthest-flung reader appeared to be Ian Cannon of Chatham Island, New Zealand. I had no intention of starting a sort of competition, but I'm certainly intrigued by getting a letter from another reader who has been flung so far that it took months for her to respond.

She is Mary Ayres, a doctoral candidate in cultural anthropology at the University of Chicago. Her research consists of living in a tiny village, Rouku, near the Morehead River in the Western Province, Papua New Guinea. She says she lives in a native house, raised four feet off the ground, with a black palm floor, a frame of saplings, walls of bark and a paperbark roof. No electricity. No running water except for what runs off the roof during a tropical rain. Kerosene for light. A big part of her research is to approximate the way her fellow villagers—25 of them—live, and she finds it comfortable and friendly.

What does she miss? "Cold beer, talking with friends in rapid English, dining out, dressy clothes, make-up and high heels." She says life is surprisingly complex when you are expected to know the language, customs, myths, family relationships and lay of the land.

"Into my world," she writes, "comes SMITHSONIAN magazine. After the Talair pilots read it in Daru, they bring it to me in Morehead when I meet the once-a-week plane. After I finish with it, I pass it on to a young Irish couple working for the United Nations in a deer-farming project on the Bensbach River, a mere 40 miles west of here. After they finish with it, they give it back, and I put it in a box full of any and every magazine I can scrounge, which the village kids look at. The older people, who never went to school, don't know how to 'see' pictures. One old woman could not recognize herself in a close-up photo."

Mary Ayres says her gift subscription has run out, so maybe she doesn't qualify to us as a far-flung reader. Well, we'll see.
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Phenomena, comment and notes

A physicist argues that it is only the participation of us the observers that gives tangible reality to the universe

Quantum mechanics is going to be the death of me. I find it easy to avoid the absurd but mind-clearing questions that seem to be central to Zen. And I've happily avoided quantum mechanics for more than half of my allotted life span. The trouble is that lately I keep encountering echoes of a Danish voice I never heard, that of Niels Bohr, telling me that the preposterous answers of quantum mechanics are reality and it is my view of reality that is absurd. It's disrupting, exciting, hard to ignore.

Another voice I keep hearing on the subject, a voice very much still with us, is that of John A. Wheeler, a theoretical physicist now at the University of Texas at Austin. After a career at the very top of his field, and perhaps most famous for his work on black holes, Wheeler is striking out into terra incognita, traveling alone. At a Lake Como conference on problems in the foundations of physics, in a paper since published by North-Holland as *Frontiers of Time*, Wheeler shows how the very existence of the universe may one day be derived from the "higgledy-piggledy" of quantum dynamics.

"As surely as we now know how tangible water forms out of invisible vapor, so surely we shall someday know how the Universe came into being. We will first understand how simple the Universe is when we recognize how strange it is," he told the conference.

We use quantum effects every day in a transistor to control machinery, inside a molecule to design an anesthetic, in a superconductor to make a magnet. Quantum theory alone correctly describes the states of elementary particles, of atomic nuclei, atoms, molecules and larger systems, and collisions between them.

The word quantum means simply a discrete quantity of something, a "hunk." In the very small world of atoms and subatomic particles, physicists discovered early in this century, radiation is emitted only in packages, and objects can have only certain quantities of any characteristic such as electric charge or spin. Quantum dynamics describes this invisible world, where the rules are so different from those that govern the macroworld we live in that they violate our intuition. The quantum world is one of random chance, where it is impossible to predict the future of any given object. It is impossible even to find out very much about any single object as the link between cause and effect disappears.

And yet it is also quantum theory that tells us that reality is not really real until we see it or some recording device registers it: "No elementary phenomenon is a phenomenon until it is a registered or recorded (observed) phenomenon," Wheeler repeats and repeats. Not only does the present not exist in some concrete form, even the past is only theory until it registers in the present. J. J. Thomson discovered the electron in 1897, but even today we can find out only so much about any given electron, and no

Dr. John A. Wheeler directs Center for Theoretical Physics, University of Texas.

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more. If we set up an experiment to find its position, we exclude any possibility of giving any meaning to "where it was going." Our question produces an answer that precludes all other answers.

Wheeler offers an analogy that makes this indeterminacy painfully clear. In the classic game of 20 questions, one person goes out of the room, others agree on a word, then the first person returns. He or she can ask only questions that have a "yes" or "no" answer: Is it alive? Is it bigger than a bread box? If the questioner determines the answer in fewer than 20 questions, he or she wins.

In Wheeler's version one person goes out of the room, and the rest of the players secretly agree to have no word in mind when the game starts. When they answer a question, however, they must have a word in mind for which their own answer is true, and every preceding answer has been true. In Wheeler's example, the game ends when the questioner guesses the word "cloud." But, he emphasizes, the word "cloud" did not exist (as the answer) when the game began. Different questions would have elicited a different word. In the same way, Wheeler says, the questions an experimenter asks of an electron determine the answers. Different questions produce different answers.

Asking a question of the electron has an irretrievable consequence for its future. Even worse, the electron is more properly thought of as a wave of probability, having no more than a potential existence, until we actually detect it.

Just about one lifetime ago, scientists still thought of the universe as clockwork. A machine. Now, Wheeler says, that is a "cracked paradigm." No one knows the plan of physics. We have clues, but no answer. Niels Bohr, who forced us to give up our ideas about causality, even reality, deliberately said nothing, Wheeler notes. "That he did not propose an answer, not philosophize, not go an inch beyond the soundest fullest statement of the inescapable lessons of quantum mechanics, was his way to build a clean pier for some later day's bridge to the future."

Bohr's "inescapable lessons" are wrenching enough. Photons that left faraway stars long ago are not counted as photons until they are recorded, blackening a grain of silver bromide or triggering a photodetector. There is a real sense, Wheeler says, "in which we in the here

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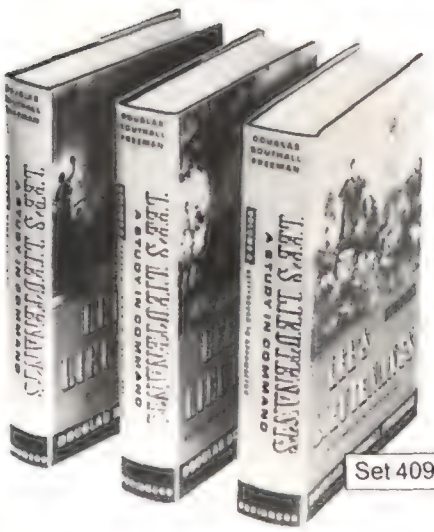

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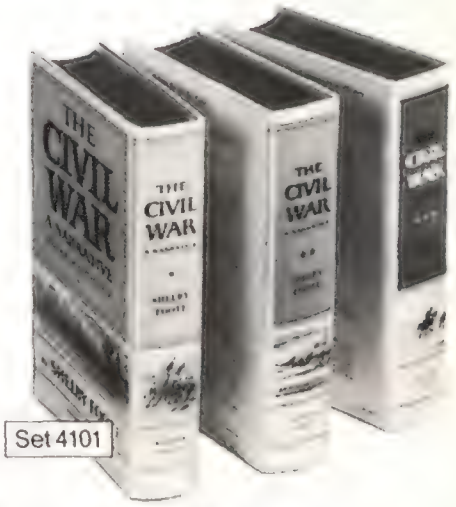

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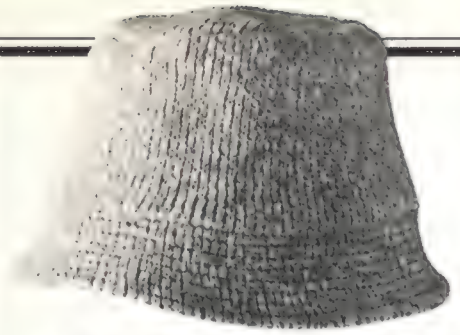

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and now play a part in giving tangible reality to that which had supposedly already happened in the remote past." Photons that escape our view also have a reality, but one of a "paler and more theoretic hue."

The vision of the universe that is so vivid in our minds, Wheeler suggests, is built on "a few iron posts of true observation . . . but most of the walls and towers in the vision are of papier-mâché, plastered in between those posts by an immense labor of imagination and theory."

Shakespeare seems to have had the first word that still stands. In *The Tempest* these lines appear:

"These our actors,
As I foretold you, were all spirits, and
Are melted into air, into thin air;
And, like the baseless fabric of this vision,
The cloud-capp'd towers, the gorgeous palaces,
The solemn temples, the great globe itself,
Yea, all which it inherit, shall dissolve
And, like this insubstantial pageant faded,
Leave not a rack behind. We are such stuff
As dreams are made on. . . ."

Nothing is spared in this new quantum world. Not only do particles exist in a never-never land, but space and time themselves are only means devised by us to coordinate our experiences. They begin and end in what Wheeler calls the Gates of Time: the Big Bang, the Big Crunch (when the universe stops expanding and collapses in on itself again) and black holes, where space and time come to an end locally. Time does not run from everlasting to everlasting. To speak of "before" the Big Bang or "after" the Big Crunch is meaningless.

The central question for Wheeler is how to bring the universe into being out of nothingness with no prior laws. He means not just a vacuum but nothingness, not only no structure but no plan.

To build a universe out of nothingness, Wheeler suggests, take physical law, and space-time as part of law, and then out of law build substance. Build law, he suggests, out of billions upon billions of acts of observer-participancy, each of which by itself is utterly random. Like the word "cloud" in the game of 20 questions, the universe will take shape from those acts.

After all, plant and animal species arise out of the accidents of genetic mutation and natural selection. Even our laws for the behavior of gases or the movement of heat have their origin in the chaos of molecular collisions.

Wheeler continues the argument: "But as for the molecules themselves, the particles of which they are made and the fields of force that couple them, is it conceivable that they too derive their way of action, their structure and even their existence from multitudinous accidents?" The answer, he clearly believes, is yes. As he put it at an MIT conference last May, "many a chance 'yes-no' add up to the definiteness of 'how-much.' "

The universe, Wheeler says, is "a self-excited circuit. As it expands, cools and develops, it gives rise to observer-participancy. Observer-participancy in turn gives what we call 'tangible reality' to the Universe."

Is Wheeler correct? I certainly don't know. Other physicists tell me they listen with deep respect, but are not yet ready to follow. Wheeler feels that the strangeness of the universe, and the simplicity of that strangeness, is such a clearly visible mountain peak that we, and he, "can afford to toil up and down many a wrong mountain valley, certain stage by stage to reach someday the goal."

In the introductory passage of his Lake Como presentation, he clearly enjoys not being sure. He invents a skeptical colleague from another field, explains some of his ideas, then hesitates to go on. The colleague implores him: "You have told me more than once that science advances only by making all possible mistakes; that the main thing is to make the mistakes as fast as possible—and recognize them. You like to quote the motto of the engine inventor, John Kris: 'Start her up and see why she don't run.' "

In another talk, this one last summer to a first-ever joint meeting of the American Philosophical Society and the Royal Society in London, Wheeler compared quantum theory to the Hawaiian Islands. Just as that island arc was produced by a series of volcanic eruptions, so the quantum, "fiery creative force of modern physics, has burst forth in eruption after eruption and for all we know the next may be the greatest of all."

Frankly, I'm not ready. I'm only beginning, dimly, to appreciate Bohr. I'm only barely following Wheeler, and he's still going strong. Another quantum eruption? I can't wait.

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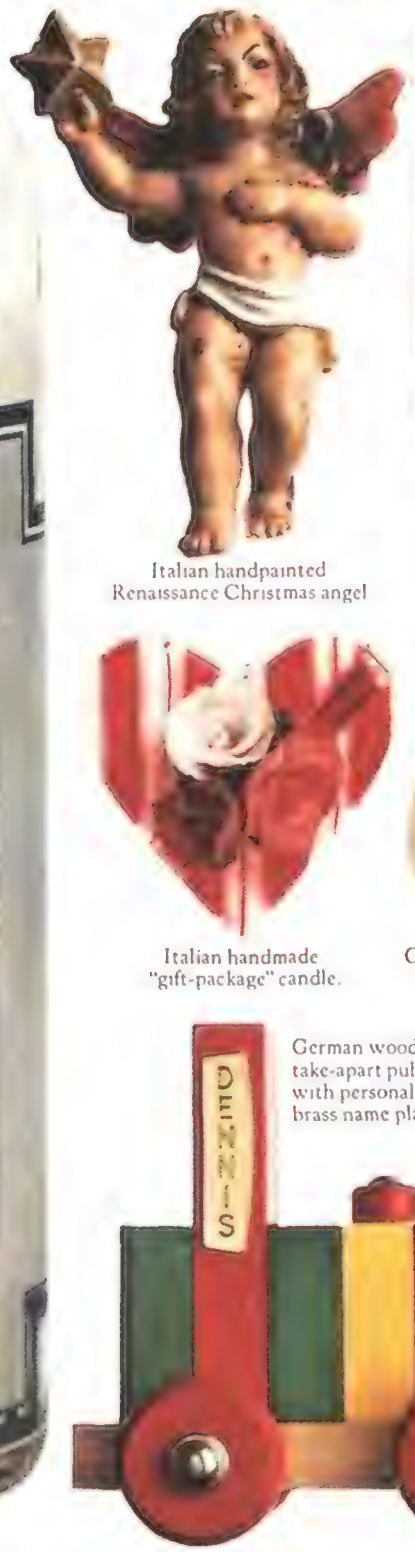

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PUBLISHER'S NOTE: *After studying anatomy and physiology at Oxford University, England, Dr. Horrobin taught there as a Fellow (Don) while working for his doctorate in Neurophysiology, and went on to take his medical training at St. Mary's Hospital Medical School, London. He has served as Chairman of the Department of Medical Physiology at the University of Nairobi Medical School, Kenya, on the faculty of the University of Newcastle upon Tyne in England, and in 1975 became Professor of Medicine at the University of Montreal. A pioneer in the study of essential fatty acids and prostaglandins (now often referred to as "magical" hormone-like substances), he heads his own research organization specializing in the investigation of nutrition-drug interactions in medicine and also is Medical Adviser to the Schizophrenia Association of Great Britain.*

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By Michael Parfit

Alaska's natives are bringing off the biggest corporate takeover

Regional corporations set up by Congress to settle land claims are now running everything from fishing to high finance

Boardroom is native habitat for Perry Eaton, banker and treasurer of one of 13 regional corporations.

On a rainy day at Mirror Lake, just outside Anchorage, a small group of Alaska natives—Indians, Aleuts and Eskimos—gathered to launch a symbolic boat. They celebrated with hamburgers and sun-dried salmon, smoked moose and chocolate cake. They drank Hawaiian Punch. Standing in the rain, they cheered as a crew of brawny young natives pushed the boat into the water. The elderly Eskimo who built it, Paul Tiulana, knelt in the prow, his face set toward the water. The boat was an umiak, the Eskimo whaler. It was 28 feet long; its ribs were steam-bent wood; its translucent skin was walrus hide stitched with caribou sinew and tied to the frame with nylon rope.

As the new boat rode on the water like a fresh-blown leaf, Tiulana laid his cane on the ribs and plunged his paddle deep, driving the umiak toward some memory, the gasp of the whale and the boom of the pack ice sounding in his ears.

But the lake was still, reflecting the vacation cabins on its far shore, and soon the natives who watched would be on their way back to the city from this salute to their past, returning to the offices of the corporations that control their future. In other places in Alaska many natives still depend on boats, nets and harpoons for survival, but as compelling as their ancient culture may be, for some the boardroom makes more insistent demands.

One of the remarkable things about this upheaval is simply that so few people in the rest of the United States know it is happening. Fascinated as the American public usually is with Indians, it does not seem to have noticed that in Alaska about 78,000 natives are trying out a new system of self-determination, which

Earth mover chugs across Alaska's North Slope, where oil boom spurred development of entire state.

A welder works on an Anchorage oil rig, constructed and operated jointly by NANA and private firm.

has been called by various authorities a great social experiment, land reform on an unprecedented scale, or an enormous social disaster.

This huge change, brought about by the Alaska Native Claims Settlement Act passed by Congress in 1971, ought to be famous. Not only does the experiment involve 44 million acres of what used to be federal land and a billion dollars of tax money, but it also has married the natives, for better or worse, to the most cherished modern American institution, the corporation. Out of this shotgun union leaps an important question: have the American people at last found a way to treat natives with justice, or are we still trying to mash a unique people into a mold that won't fit, while we steal their land and destroy them forever?

The answer is far from clear. Its dominant characteristic, in fact, is contradiction.

"The Settlement Act was a continuation of America's attempt to obliterate the native," said Willie Hensley, the most prominent Alaskan native leader. "But it depends on how you use the doggone thing. We now have something no other minority group has in this country—we have land, capital, and we have identity in culture. I mean, we have a leg up!"

The Settlement Act was born, like most Indian legislation, out of a desire by American corporations for lands claimed by natives. In this case a group of oil companies wanted a corridor down the center of the state in which to build the controversial Alaska pipeline. But the natives, with perfect timing, had claimed most of the state, and because they had never signed their land away by treaty, the claims had power. So in 1971, pushed by both the oil companies and the natives, Congress passed an act—praised by nonnatives for its generosity—which promised the natives clear title to 44 million of the acres they had claimed and paid them the $1 billion for the rest. Among the conditions of the settlement, spelled out in ambiguous complexity in a 27-section act, was a requirement that the natives organize into corporations "to conduct business for profit."

The Act was no subterfuge; natives had lobbied hard to get it passed, and there is still a sense among them that their timing was perfect. "If it had been ten years earlier we couldn't have gotten the money," one native remembered. "If it had been ten years later we couldn't have gotten the land." So there was a surge of pride when the Act was signed. "I swear," said Perry Eaton, a native banker whose zest for the Act is matched only by his enthusiasm for eloquent commentary, "even the drunks staggered with more dignity."

Michael Parfit, a frequent contributor, wrote on alcohol fuel in the March issue. His recent book Last Stand at Rosebud Creek *is on energy problems.*

But from the native point of view the first real changes made by the Act were negative. "We sat down and went through it for three days," said John Schaeffer, an Eskimo National Guard officer, who is now a corporation president. "Our general reaction was that it was written by people who wanted to end up with our money and our land." What better way for American corporations to loosen up access to those 44 million acres (the fear ran, and still runs today) than to guide natives into unfamiliar business enterprises and tell them they have to make profits from land that had previously made only browse for caribou? If the companies weren't invited in immediately they'd just have to wait a few years for default. Thus the first of many contradictions: the Act hailed by some as the most generous settlement in history could turn out to be the biggest theft.

Typically, however, the very dangers in the Act have been, in retrospect, a source of encouragement to native leaders.

"When we read the Act we thought we were doomed to failure," Schaeffer continued one afternoon, sitting in his office in Kotzebue, on the northwest coast of Alaska. "That's how I maintain my optimism. We've tried to make it less doomed, and we've been quite successful."

Kotzebue village becomes a corporate center

The buildings of the town of Kotzebue are arranged along the edge of a spit of land like glittering teeth on a jawbone. When the ice is out and the day is clear, the sky and the bay are the same pale blue, amazingly clean. Along the shore, weighted oil drums hold back the tide, nets dry in the sun, dogsleds and caribou racks make bony silhouettes on the tops of houses, tethered skiffs drift back and forth like horses grazing on the current, and small flatfish lie dead on the stony beach, their entrails pecked out by gulls. The air is full of the sounds of dogs barking and of three-wheeled motorcycles with bulbous tires zooming around everywhere on the gravel roads like strange red steeds out of a space movie.

This village of about 2,000, where jet airliners stop four times a day, is capital city of the domain known as the NANA region, named after its corporation, of which John Schaeffer is president. (The acronym NANA came from an old association no longer in existence.)

Schaeffer is a quiet, practical Eskimo. He has a striking, pale brown face; his ears are swept back against his head, giving him the look of a large, wary cat. He seems to pad softly through the world of business he has entered as president of NANA. Schaeffer flies to Asia one week to negotiate the sale of reindeer horns

The Sheraton-Anchorage, built for $25 million, is owned by native corporation, operated by hotel chain.

Mineral exploration and mining in Brooks Range could bring big payoffs for NANA Corporation.

John Schaeffer, NANA's head, gets fence-post view of one investment—a reindeer ranch near Kotzebue.

to the health tonic market and the carving of jade mined on NANA land, and to Houston the next to talk about oil drilling, with a few days in between to work in his small office overlooking the pale blue bay.

NANA is one of the most successful of 13 regional corporations, the big guns of the Settlement Act. The Act also created about 200 small village corporations. NANA has 4,828 stockholders, about 2.3 million acres, assets of about $60 million, and earnings per share in 1980 of 28 cents. As required by the Act, each stockholder owns 100 shares of NANA stock and 100 shares of village corporation stock, neither of which can be sold or otherwise alienated until 1991.

The fact that each native born before the passage of the Act owns 100 shares is one of the things that sets native corporations apart from others. "There's no other corporation in America where if you have ten kids you've got more voting power than the president," one native said.

This unusual arrangement, which often makes corporation presidents behave more like mayors in search of votes than executives, plus the prominent decision-making role and financial weight of the corporations in their communities, makes them too political to be defined simply as private industry but too autonomous to be called government.

A visiting American executive, already stunned by the equality of share ownership and quasigovernmental position of the corporations, would be further shaken by the way the corporations backed into business. "Somewhere else a guy starts out with an idea, goes to a partnership and then a corporation, and is in a constant search for capital and leverage," said Perry Eaton. "These were formed with lots of capital, a lack of corporate leadership, and no product."

"It's a whole upside-down world," one Alaska Indian said. "The great men in the Indian culture were men who distributed wealth—they gave it away in potlatches. In the other world the big men are men who accumulate. That's a difference."

The look of "diversified conglomerates"

But many of the corporations have scrambled around and assumed profitable personalities. The Arctic Slope Regional Corporation, which owns 4.5 million acres near the oil fields of Prudhoe Bay, is becoming an aggressive construction and energy development firm; corporations on the coast in southeast Alaska whose lands are cloaked with Sitka spruce are focusing on timber operations and fishing; and NANA and Cook Inlet, Eaton observed, "have taken on the profiles of diversified conglomerates."

Although it is a profit-oriented company, NANA is not, like most other U.S. corporations, interested just

Anchorage bank chairman Willie Hensley believes the Settlement Act has given Alaska's natives a "leg up."

in making money. In the words of an Alaska economist, NANA has "broadened its goal structure." In the words of a NANA board member: "We don't work in the holy name of the dollar."

NANA has five main aims, Schaeffer said: to achieve stockholder self-sufficiency, to achieve village self-sufficiency, to preserve and enhance the Eskimo culture, to protect the ability of the land to provide food—what Alaskans call the subsistence culture—and, finally, to make a profit. To reach these goals the corporation has invested in low-profit operations such as selling fuel in its villages, ranching reindeer for horn sales and meat, and operating a museum in Kotzebue, while concentrating its money-making efforts on things like a joint venture with a U.S. firm to build and operate huge oil-drilling rigs for the North Slope.

In pursuing these wider goals, Schaeffer and his other managers have involved the NANA stockholders, with interesting results. When choosing the land the corporation wished to claim under the Settlement Act, Schaeffer first asked the elders of each village to make their selections, then commissioned outside consultants to do a million-dollar study. Plotted on multicolored overlays two years later, the two outlines matched almost perfectly.

Schaeffer smiled. "The elders were experts," he said.

But broadened goals or not, even NANA cannot hide the contradictions woven through the pattern of the Settlement Act. Many natives expected the settlement either to make everyone a millionaire or to put everyone to work; instead, the Act has been more like getting a small stock inheritance from an uncle: you can read market reports in front of your friends, but you don't get to count much cash. NANA's 1980 dividend of 75 cents a share didn't amount to much in an area in which even those who live off the land buy outboard motors, snowmobiles, three-wheeled motorcycles and gasoline. Alaska natives are just like the rest of us: the word "corporation" is magic—it conjures up images of Learjets and million-dollar snap decisions. No wonder a 75 cents per share dividend leads to discontent.

On the same day that Schaeffer talked about his broadened goals, a young Eskimo stood outside his tiny plywood-and-tarpaper home discussing the Settlement Act while, nearby, a friend, who had just returned from hunting, peeled dried blood from his hands. The Eskimo's sardonic smile showed missing teeth and pessimism.

"They ought to give us more money," he said. "I think they're keeping it all for themselves."

Money. NANA's broadened approach to profits is not shared by all the regional corporations. Others, particularly those whose population is already more in tune with the cash economy than are northwest Alaska natives, have chosen a more American route, perhaps with the goal of eventually satisfying that young Eskimo's complaint. But there is contradiction in this, too: in seeking profits many of the native corporations have decided to hire nonnative presidents or managers who will be free from goal-broadening pressures. Koniag, Inc., the corporation that covers the island of Kodiak and surrounding territory, is one such firm; after several years as rocky as its coastline, it hired an executive from International Paper who swiftly set the corporation on that narrow path.

Outside managers provide stability

"He asked us what the corporation's primary responsibilities were," said Karl Armstrong, who is, among other roles, a Koniag board member. "We said: 'To the stockholder.' He said 'No. The first responsibility is to produce a profit.' "

Karl Armstrong's father was both the only U.S. Marshal on Kodiak Island and the region's biggest bootlegger, so it is not surprising that Armstrong should have become a Washington lobbyist. He is a large, friendly man, not unlike a genial old Kodiak bear that has spent a lifetime abundantly satisfying a taste for pink salmon. He is pleased with the new man. "We do not interfere with him," he said. This arrangement, Perry Eaton said, saves the corporations from internal political disruption. The outside executive is hired to do a job; he has no family or racial ties to complicate his decisions, and if he fails he can be booted out without setting off a feud. "He gets the opportunity of a lifetime," Eaton said. "And we get administrative stability."

Armstrong has spent the past several years commuting to Washington to use his guile to help add sections to the recent Alaska Lands Act amending the Settlement Act. Among the provisions in the new Act, signed by President Carter at the end of his adminis-

Timber operations, like this Japanese-owned camp at Jakolof Bay, are attracting new native investment.

At Bristol Bay, a major corporate activity is salmon fishing; here sockeyes are hauled in over a roller.

tration, was a section setting up a protective land bank, so corporations would not be forced to develop or sell land to pay taxes.

The Act also contained a controversial amendment to the Settlement Act that, if it is not found unconstitutional, would forbid nonnative purchasers of shares from voting in corporate elections. The amendment is intended to ward off outside takeover after the stock is freed in 1991, but it points out another contradiction: if the stock becomes valuable to outside buyers, some individual natives may sell, thus diffusing overall native power; but if it becomes worthless to others, it will mean, in nonnative terms at least, that the corporations are failing. There's further confusion: the amendment calculated to preserve native control of the corporations could lower the value of shares by making them less interesting to outsiders.

These intricacies probably will be addressed by future Congresses at the prodding of people like Armstrong, who could hardly get any busier. In the nine years before the Lands Act's passage, Armstrong logged 80 separate flights between Washington and Kodiak.

That kind of travel isn't cheap. Neither is the hourly rate for legal firms such as Duncan, Weinberg and Miller of Washington, D.C. But Koniag retains Edward Weinberg, a former Interior Department solicitor who is now a member of that firm, and pays the bill. Lawyers and lobbyists have consumed a healthy portion of the $1 billion settlement as the natives tried to amend the Act into working shape and fight out its legal ambiguities. "Koniag has spent at least $1 million on lawyers," Armstrong said. "The most expensive thing we could have done was hire cheap attorneys."

But Emil Notti, a small, quiet, statesmanlike native who was an architect of the Settlement Act, said softly, and a little sadly, "Just an enormous amount of money is being spent for advice." Unfortunately, some of that advice is on how one corporation can fight another.

At 47, Emil Notti still looks like a boy, the kind of unassuming, brilliant boy who could hold a neighboring gang together without ever raising his voice or flaunting his intelligence. He's a Central Alaska Athabascan, who trapped along the Yukon with his father when he was a child, and who became, in his 30s, a unifying force behind the Alaska native resurgence.

"Emil was the magic man," Eaton said. "He could put all these Inupiats and Aleuts and Tlingits and Athabascans and Koniagmuits at a table and get order out of it. It was like the French, Germans, Poles, Czechs and Ukrainians coming out with a common market in two years."

It is, again, an ironic contradiction that the unity Notti and others welded among themselves to pass the Settlement Act is attacked by the Act itself. In the Act the natives were divided into competing groups; then, by requiring vaguely that each region must share 70 percent "of all revenues" from mining or logging with the other regions, the Act set off a chain reaction of suspicion and litigation among groups, which led to more legal fees.

Although the native leaders so far have resisted the dividing forces and saved much of that unity, it may

be significant that Notti himself no longer seems to be an active leader. He is now a management recruiting consultant, and has diminished his native leadership role into doing such things as lending his ideas and his voice to a film about land management designed to be shown in villages. In the film his unemotional narration murmurs along behind scenes of tundra sunsets and caribou herds, carrying the news gently to his people: "The days of unrestricted lands are gone."

Battle over resources now internal

This news, of course, is at the heart of the Settlement Act, and is the part most burdened by contradiction. Hailed as a victory, the Act was more the acknowledgement of a loss, a picking up of broken pieces. In attempting to give the natives a chance to preserve something of their way of life, the Act had to destroy a fundamental part of the culture by making the land legal property and carving it up into chunks. "In our village the land was your home: you used it, and it would be forever yours," said a native who is part of the government's ten-year-long effort to transfer title to the 44 million acres. "As far as we were concerned, title to lands meant nothing."

Most important, the Act took a conflict over the land and culture that had been flickering along for some time and blew it into a formal blaze. The issue is subsistence: living off the land. By setting up profit-making corporations, and giving them control over many of the resources on and under the land, the Act took the battle about the future of the land that had been fought generally between native and outside developers and shoved it like a knife into the native community itself. Although a firm like NANA, with its broadened goals, could legitimately decide to forbid mining in a caribou breeding ground even at the cost of revenue, a more strictly profit-oriented corporation could not. This clash is made a little more vicious by the provision in the Act that village corporations, which own much of the land, only control surface rights, and the regional corporations control minerals.

"We have a culture based on a rapport with nature," John Schaeffer said. "A respect that is not in the Western culture. That's a major conflict for some of us who run a business that has to develop profits. It makes it very difficult for a resource developer like me to get along. So we make compromises."

All the compromise, conflict and contradiction lead to the one striking consistency about the Settlement Act—how well it fits history. America's past arrangements to deal with the menace or misery of the continent's aborigines have followed an apparently erratic route, as policies zigzagged from elimination to self-determination to accommodation to termination. But there's a pattern. First, the policies always sought to open native lands to Western forms of development. The Alaska Settlement Act is no exception: although natives here are more involved in the decisions than in the past, the Act encourages that development.

The second parallel is developed in an enthralling theory described by a UCLA law professor, Monroe E. Price, in an essay on the Alaska Settlement Act. To Price the thread that ties it all together—from the Dawes Act of 1887, which put Indians on farms, to the Claims Act of 1971, which puts them in corporations—is that what the American people decided to do to natives reflects our own image of the perfect society, "the ideal for all within the community." The reality of native life is mostly invisible to us, Price writes, so we invent a romantic ideal native, and give him our ideal way of life. Thus when the small farm was America's utopia, we passed the Dawes Act; when socialism looked promising in the days of the New Deal, we put Indians back on collective reservations; when demands for racial equality attacked ethnic uniqueness, we moved toward "termination" of cultural segregation. Again, the Settlement Act seems to fit. Today, in a modern corporate society that is underlaid by a yearning for the simple life, for living off the land, we

Aleut leader Allen Panamaroff, in Kodiak, reflects on native values lost in rise of corporate economy.

once again pass on our ideal, contradictory world.

So far, the Alaska native leaders have successfully thumbed their noses at the confusion in the letter and the application of the Settlement Act: none of the corporations has actually gone bankrupt, and some are already profitable—an excellent record for new companies anywhere. Some, like NANA, may even be showing other U.S. corporations that broadened goal structures, such as social and environmental responsibility, can be corporate wisdom, not folly.

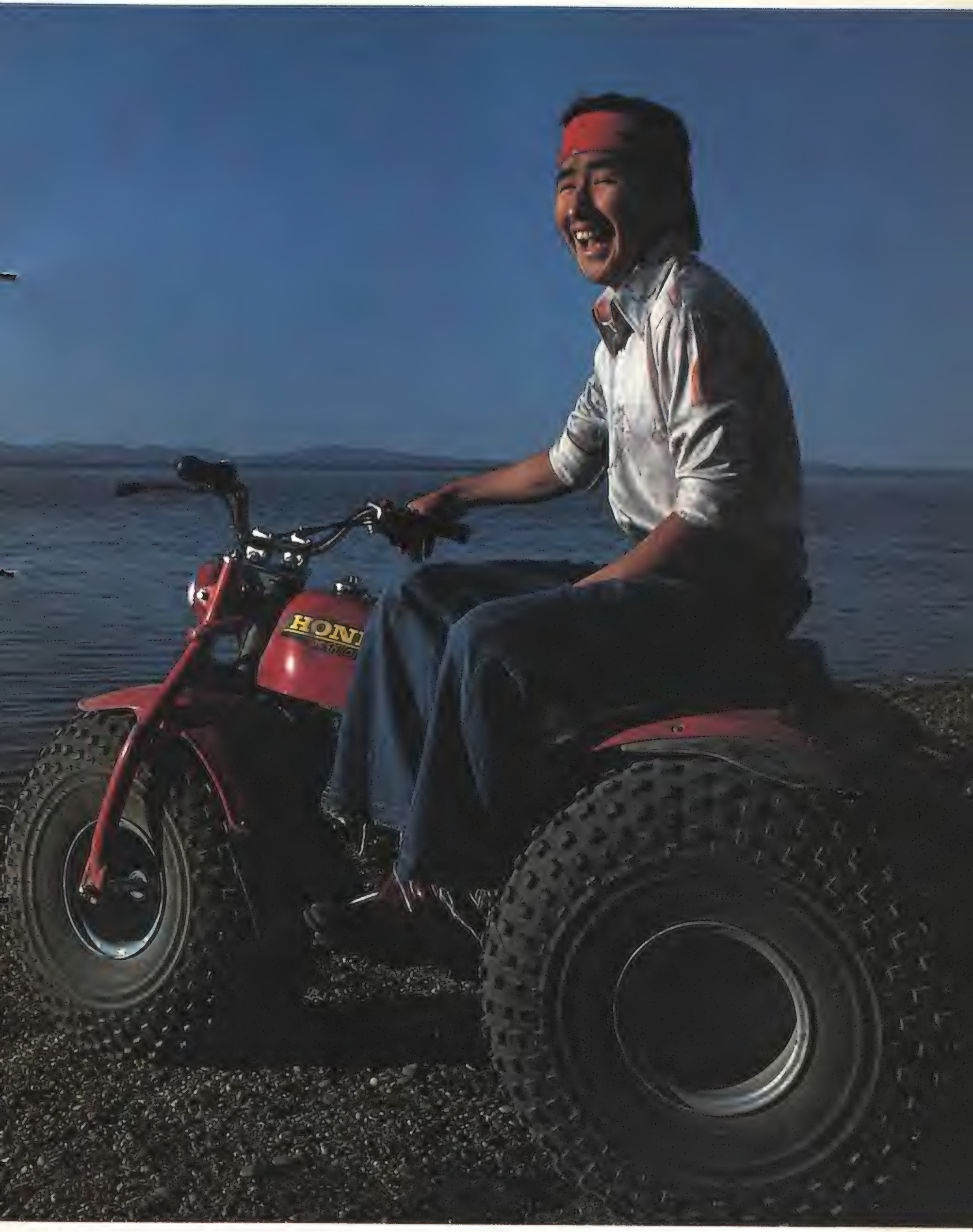
As a mechanism for dealing with changes that were coming to Alaska anyway, the corporations may be perfect. It's always useful to have the tools and the language of the invading force, whether it's an army or a culture. One corporation, Sealaska, is number 951 on *Fortune* magazine's list of 1,000 largest U.S. firms. "They're turning into tough competitors," says a consultant for Sohio who was a key executive in the pipeline project. Perry Eaton is buoyant: "The native leaders are scavengers, sorting through the debris of merging cultures, picking up shining gems." Emil Notti is quietly hopeful: "In time the inheritance will come back to the people."

But except for the leaders, who would have been successful anyway, although in less exciting roles, the Settlement Act so far has brought just a few more dollars and more complexity to the difficult world of the Eskimo, the Aleut and the Indian. So far the Alaska Land Claims Settlement Act, for all its money and titled land, has not ended the long lament of the North American native.

The words echo. On Kodiak Island a 35-year-old Aleut leader named Allen Panamaroff came to visit Karl Armstrong and stayed for steak and tea. He is from a town on the island's west coast, where subsistence and cash economies mingle. He is president of the town's corporation. This evening his eyes flashed with some kind of anger he was afraid that he could not express.

"I've got a little liquor in my system," he said. "I don't know if I can really say it." He tried. "Corporations were forced upon my people—they didn't understand it when it was passed. They still don't understand it. They don't understand people telling them they have certain boundaries. My people didn't need the money. They didn't need the value of being important. All they needed was a duck or two, or to get a deer, so two or three families could share. The most valuable thing they knew was a seal liver. My people were the richest people in the world."

Native on popular three-wheeled motorcycle, and subsistence fisherman, symbolize modern Alaska.


HONI

Guests fill Saratoga's Casino ballroom for Marylou Whitney's gala; this one had diamonds for a theme.

After predawn workouts on the exercise track, horses are "hot-walked" by stable hands to cool them off.

By Whitney Tower

At old Saratoga, the horseplayers mix with history

The ancient spa, a famed rendezvous of high-rolling gamblers, now echoes to symphonic sounds as well as hoofbeats

Color photographs by Richard Howard

"All the world is here: politicians and dandies; cabinet ministers and ministers of the gospel; officeholders and officeseekers; humbuggers and humbugged; fortune-hunters and hunters of woodcock; anxious mothers and lovely daughters. . . ." So reads an 1839 diary entry by Philip Hone, onetime mayor of New York City. Nearly 140 years later Joe Hirsch wrote in his *Daily Racing Form* column that things were unchanged: "Dukes and kooks, counts and no-accounts, stars and czars have added to the legend of Saratoga, where it isn't enough to stay the 30 days. Staying the 30 nights is the true test of stamina."

The object of their focus, a place in the foothills of the Adirondacks some 175 miles north of New York City and 15 miles west of the Hudson River—known as Saratoga Springs—steadfastly remains today one of America's most colorful resorts. It lacks the beaches, rockbound coasts, yacht clubs and marinas of such popular watering spots as Newport, Southampton, Bar Harbor and Palm Beach. Yet Saratoga has more than made up by combining a plethora of other activities, not the least of which are one of the country's

A gilded 1905 steeplechase trophy is pressed into service for National Museum of Racing party.

finest Thoroughbred racetracks, a first-rate performing arts center and a multitude of still-active mineral springs. All this and memories, nostalgic or otherwise, of bygone days when Saratoga Springs reigned as America's version of the great European spas.

It is a minor miracle that Saratoga has survived at all, considering the forces which, periodically fed by strong reform movements, often have threatened to transform the resort into a spineless replica of many contemporary spas. And yet when racing returned last week for its traditional month-long run, it marked the 118th year of the Thoroughbred sport in this community. Attendance hovers around an average of 25,000 a day, or just about the population of Saratoga Springs for the 11 months when no such sinful pursuits are permitted within county lines.

During the race meeting, idle moments are few for the average racegoer. Life on the backstretch begins before sunup as hundreds of trainers send their charges off in the hands of cocky exercise boys and girls, to learn whether this colt or that filly is ready to fulfill its destiny in some kind of race or (the inexact science of breeding notwithstanding) will turn out to be just another well-bred bum.

Before most business folk are at their desks in the rest of the world, thousands of hungry railbirds have flocked to the clubhouse terrace for a hot breakfast and a view of the horses coming down the homestretch. Later, as the backstretch help and the horses cool out in preparation for the serious business of the afternoon's racing, the crowds have started to come.

An event added from the old days is the arrival from New York City and elsewhere of a caravan of buses. The cargoes unloaded at the gate are the real horseplayers. They have been aboard four hours or so, and in that time have studied and digested the *Racing Form* (picked up before departure at $1.50 a copy). On the return trip the small scattering of winners will try to point out to the majority how ridiculously easy it has all been. Many of the bus riders, winners as well as

Whitney Tower, scion of the racing Whitneys, has known Saratoga Springs as insider and as horse lover since his boyhood. He is a veteran turf writer.

All spruced up, a bettor uses a bench near track as his office to pick winners.

A pair of more casually dressed racing fans studiously ponder the choices.

A grizzled Saratoga veteran scans *Daily Racing Form* in search of clues.

losers, will return on the morrow, hopeful as ever.

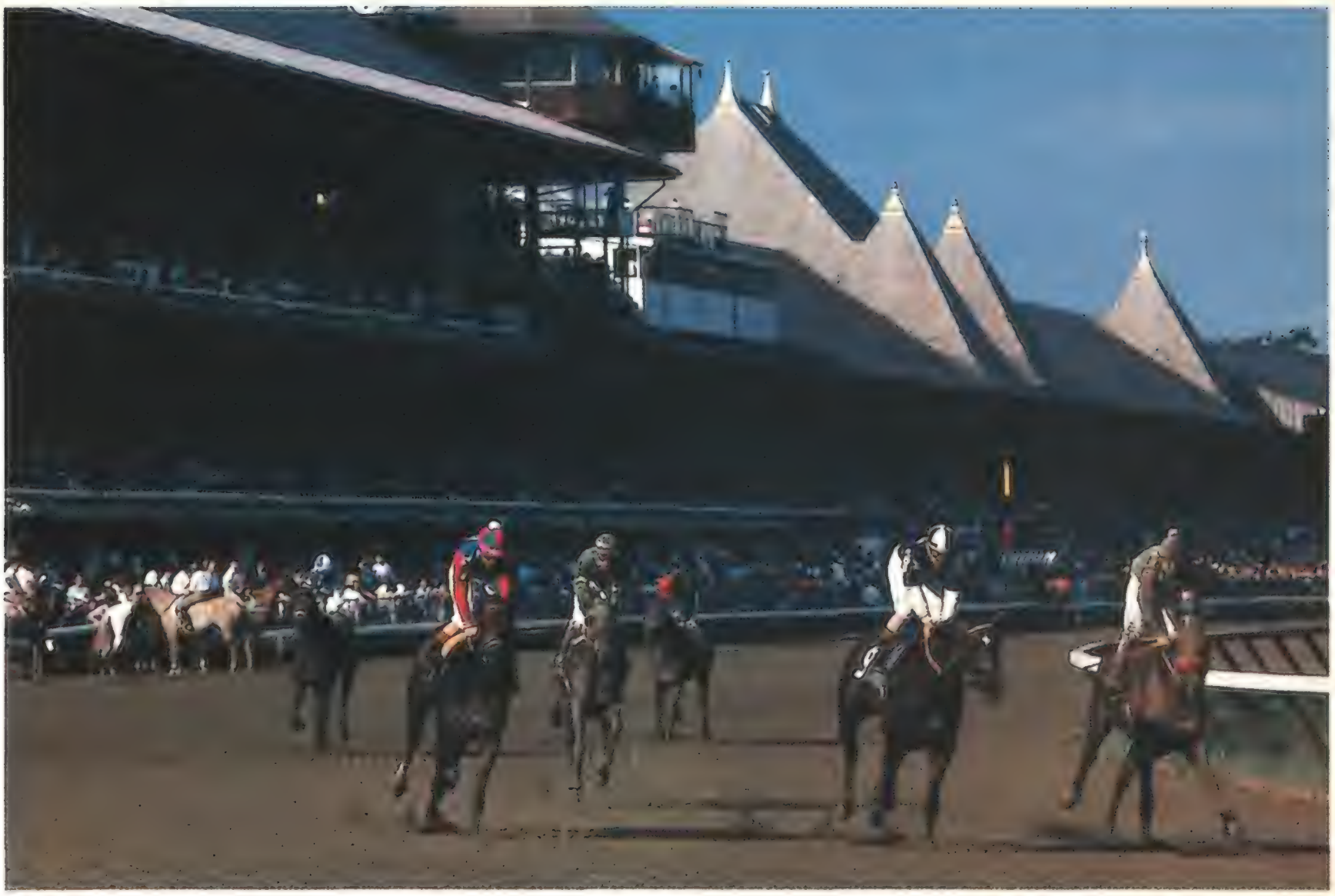
In the evening, after the ninth and final race, as the swells move on to their choice of black-tie dinners and dances, the backstretch barns, too, become the setting for cocktail parties, cookouts and dancing. Live-in Saratoga visitors are rarely more than a five-minute drive away from the track; in fact, upward of half the daily attendance probably gets to the area of the stands just as easily by hoofing it over from the motel or boardinghouse.

There is no more casino gambling. Senator Estes Kefauver, with the aid of Governor Thomas E. Dewey, took care of that in the early 1950s. The massive, block-long hotels—the best known were the United States and the Grand Union—with their colorful verandas festooned with social butterflies and hard-nosed gambling fans mixing as comfortably on the betting apron at the track as under the crystal chandeliers of the formal ballrooms, have given way to rows of motels. Horse-drawn carriages once competed for attention along the beautiful stretch known as North Broadway. They were replaced by noisy parades of Stutz Bearcats, Paiges, Pierce-Arrows and Packards, which in turn are now replaced, for August anyway, by the Rolls and Bentleys and other foreign vehicles whose horse-ornamented radiator caps identify their owners instantly as August "racing people" as opposed to travelers who may have turned in off the Northway (bound for Montreal) for a look around.

From Victor Herbert to Johnny Cash

Saratoga offers still more. The fresh country air which once was filled with the music of Victor Herbert and John Philip Sousa and the voices of Caruso and Schumann-Heink, now happily echoes to symphonies and ballets. In between came the bands of Vincent Lopez and Ben Bernie and the great humor of Joe E. Lewis, who took the mike over from songsters Helen Morgan and Sophie Tucker. Today, in an outdoor setting more fabulous than any of the old clubs such as The Brook, Piping Rock or Arrowhead, audiences are treated to a bill of fare which varies from Liberace to Al Hirt, and along the way brings in the likes of James Taylor, Dolly Parton, Johnny Cash, Glen Campbell and the Charlie Daniels Band.

The mix, somehow, is a good one. And, curiously enough, it works to the extent that from a social standpoint all levels not only survive together, but actually enjoy the entire midsummer stretch together. Where else but in Saratoga could there be a ball put on by the racing press at which matrons of the turf vied with each other to dance with their stable jockeys? It would have been tantamount to a Newport matron inviting a Bailey's Beach lifeguard to drop in for a tea dance.



At the end of a race, jockeys slow their horses as they coast around the first turn at Saratoga's long (1⅛ mile) Thoroughbred track. Clubhouse is modern but parts of wooden stands date to the Victorian era.

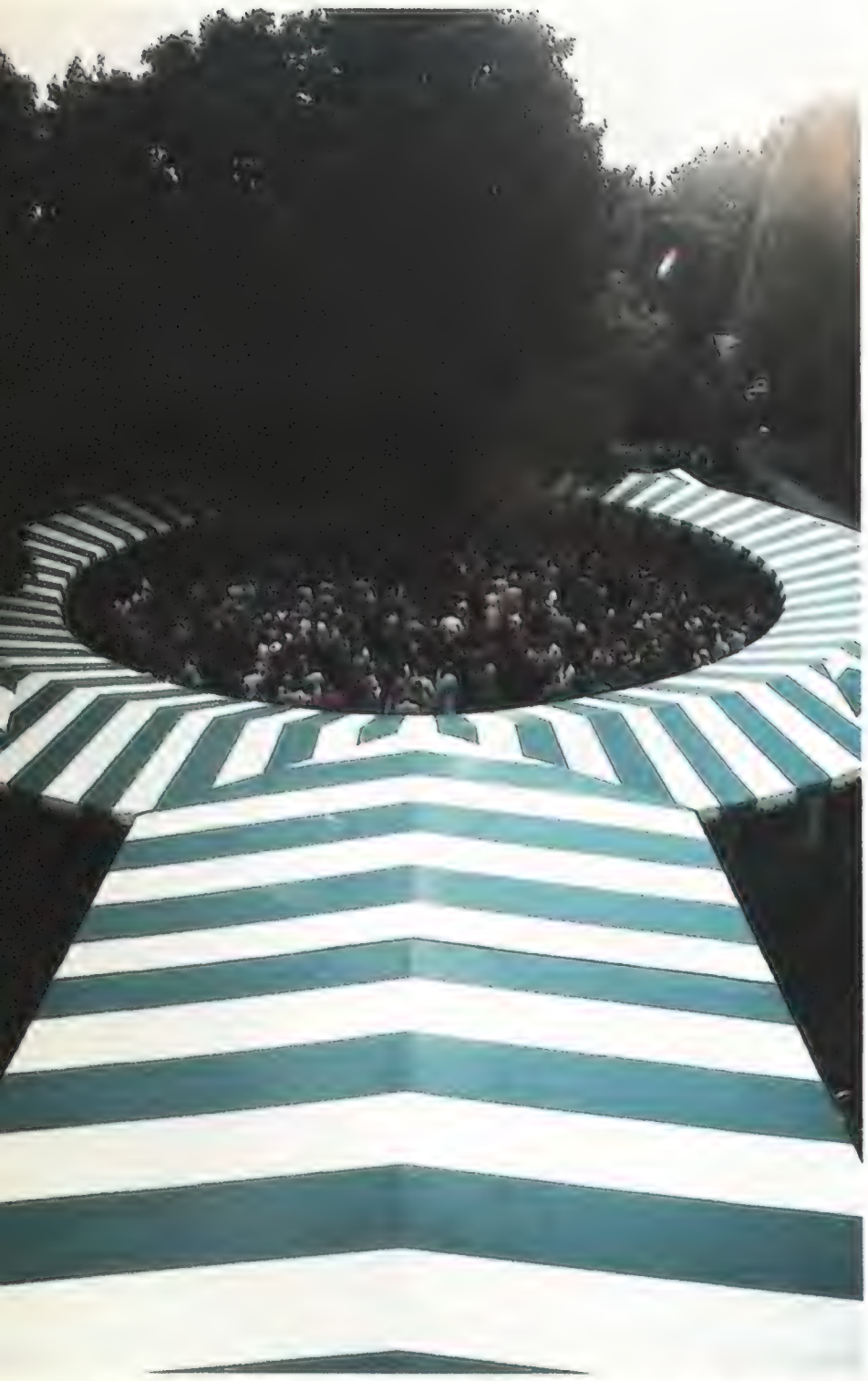
Now, of course, with all the grand old hotels gone and only the Gideon Putnam remaining as a bulwark against the Holiday Inn and such as a reminder of a more glorious age, Saratoga social life—like that of Newport—is, for the most part, conducted in rented or privately owned houses, the largest, most ornate (and most expensive) being those located on North Broadway (p. 45). Back in the first decade of the 19th century, when Gideon Putnam, a lumberman and sawmill operator (better known as hotelkeeper), drew up his "master plan" for the main streets of Saratoga, he determined that elms and maples would play a key role.

The results are lovely, and despite a series of periodic blights which have taken their toll, the stately lines of trees everywhere seem to go perfectly hand-in-hand with the mixed bag of architecture which followed. For along North Broadway (as well as many other residential streets), as the decades passed, sprang up a procession of Victorian mansions of every conceivable style. Some followed Greek Revival or along the lines of Victorian Gothic and Queen Anne. Others had a touch of the Baroque, Italian villa or French chateau. The more porches the better, and everywhere you looked there was a mishmash of porticoes, cupolas, pillars, balconies, turrets, towers and bays. North Broadway, to say the least, was noticeable.

It still is. Most of these grand old houses, constructed between 1885 and World War I, still retain the highly appealing look of the period. One of the best examples is the residence provided by Skidmore College for its president. Current occupants are Joseph C. Palamountain jr. and his wife, Anne. Dr. Palamountain describes the magnificent, expansive house built around 1902 as a pure Colonial Revival design. He does not have far to go to work. Just up North Broadway a few blocks is the new 1,200-acre campus of Skidmore, once a minor, two-year, all-female college, but transformed in 1922 to four-year status and for most of the last decade into coed status as well. Skidmore students are now 2,000 strong.

Saratoga would never have developed into the fascinating place it is today were it not for the discovery by the Iroquois Indians, probably a century before Columbus set sail for the New World, of what they called the Medicine Springs of the Great Spirit, and what is now regarded as the only naturally carbonated

Mr. and Mrs. C. V. Whitney enjoy races from their box. His grandfather helped buy racetrack, restore glory.



Outdoor party precedes Fasig-Tipton sales, where top-priced yearling of 1980 went for $1.6 million.

water east of the Rockies. In 1771 the Iroquois led Sir William Johnson, then Superintendent of Indian Affairs, to a spot known as Sarachtogoe (only one of many ways the location came to be spelled), and without his knowing it Sir William became the first of thousands of celebrities to take a sip of the waters which, depending on the strength and dosage, were found to be useful as a digestive, laxative or cathartic.

The springs also became a lure, after George Washington's first visit to Saratoga, for such other Chief Executives as Tyler, Van Buren, Harrison and FDR. Ulysses S. Grant died a few miles away while completing his memoirs following a final visit from his publisher, Mark Twain, whose interests in Saratoga lay more toward shooting a few games of billiards with the local swells. The springs—and the baths built up around them—have continued to be a major drawing card. It was around 1910 that New York state, having decided to preserve the popular mineral springs, started to lay out what is now known as the Saratoga Spa State Park, some 2,000 acres which include facilities for swimming, golf and tennis in addition to the Baths, the posh Gideon Putnam Hotel and, more recently, facilities for summer music and entertainment.

Six years after Sir William availed himself of the Iroquois' hospitality to test the waters of Saratoga, the area gave its name to one of the decisive battles of the Revolutionary War, and when General John Burgoyne surrendered near the banks of the Hudson on

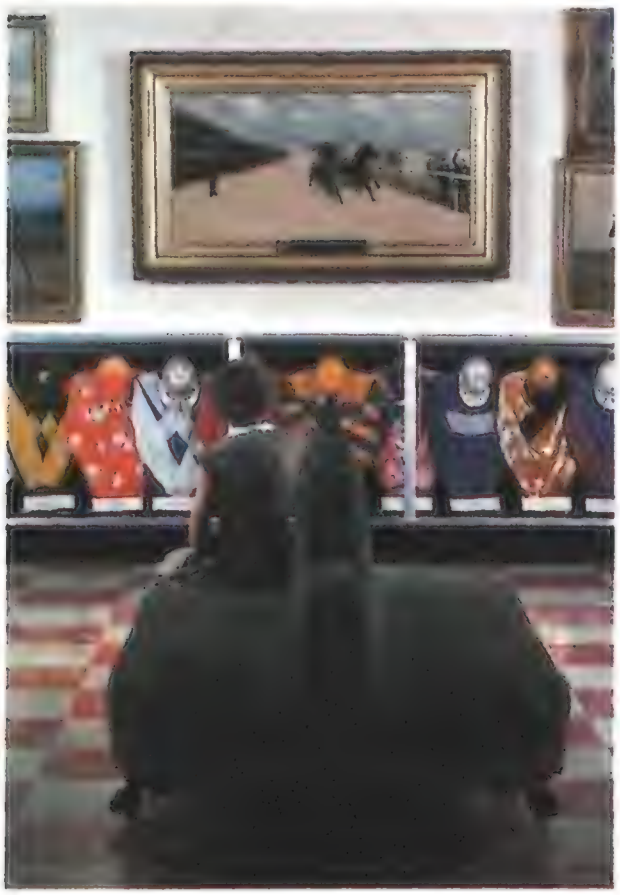
October 17, 1777, the door was opened for the general development of the area. The waters were the major attraction, but life in Saratoga before the Civil War was, by later standards, pretty humdrum. Although the wealthy were already turning to Saratoga as one alternative to Newport and other summer vacation spots, the main occupations seem to have been showing off carriages and clothes, or attending prayer meetings. One result of all this was that Saratoga County claims the nation's first temperance society.

Temperance, however (even then), could never last long when faced with the challenge of gambling. Local card games and the like weren't enough. A game known as Fly-Lo was devised, where lumps of sugar were dipped in honey and the player whose honeyed sugar attracted the first fly won. Tame stuff, indeed. Or so thought a brute and bully of a New Yorker named John Morrissey. Morrissey, an Irishman by birth, had done some skull-crushing work for the Tammany Hall boys and had won himself the title of the American heavyweight boxing champion before starting up as a gaming entrepreneur. Just to keep his hand in at any required disciplinary trades, he led New York street gangs. Morrissey acquired the name of Old Smoke after a pugilistic affair which was concluded only when his adversary held Morrissey on the floor atop hot coals which sizzled their way through both his clothes and flesh.

Casting his eye northward, Old Smoke Morrissey, age 30, declared himself respectable and made the move to Saratoga in 1861. He opened his first Club House as soon as possible, then built a new one in 1870 of red brick in what is today Congress Park. Morrissey prohibited ladies from his gaming house. In 1863 he built the first racetrack. Assisted by three of the country's most prominent horsemen, William R. Travers, John R. Hunter and Leonard W. Jerome (later to become the grandfather of Sir Winston Churchill), Morrissey discovered his track was too small to accommodate the crowds, so he built a larger one across the street the following year. This is where racing is still conducted; it retains much of the old, wooden grandstand architecture, where the boxes are bordered by geraniums and petunias and most of the American champions have been put to some of their greatest tests (p. 43). Man o' War lost the only race of his career in the 1919 Sanford, appropriately enough to a colt named Upset. Triple Crown winners Gallant Fox and Secretariat also met defeat at Saratoga.

In the old days people rolled into town from throughout the country to visit America's answer to Baden-Baden. Established Eastern racing folk mixed with new empire builders from the West, and grand ladies of the day packed so many hoopskirted ball gowns that a new flexible case was designed for them, quickly to be known as the Saratoga Trunk (a movie of the same name, based on Edna Ferber's novel, starred Ingrid Bergman and Gary Cooper).

Jockey silks and paintings at National Museum of Racing, Inc.



This stately High Victorian house on North Broadway belongs to Walter M. Jeffords jr.

"Diamond Jim" Brady (1856-1917) was said to have worn as many as 2,548 stones at once at Saratoga.

With Morrissey's death in 1878, Saratoga entered a new era. It was marked, first, by the arrival of one Richard Albert Canfield, and second by the revival of the city's high life, once Canfield had bought Old Smoke's Club House in 1894 and renamed it the Casino. He was known as the Prince of Gamblers and Canfield's Casino, which cost him $250,000—a sum he made back within the first two months—was replete with Italian gardens in what is today Congress Park.

It was, for Canfield and everyone else who visited Saratoga in August, a giddy time. The mineral fountains, with names like Congress, High Rock, Excelsior, Pavilion and Hamilton Springs, were drawing heavily from the health seekers; the racing was, as always, both exciting and fashionable; and the city's gambling emporiums were rolling along at full speed. Improved transportation, especially by railroad and steamboat, helped to double the population every summer.

And it was, too, for the average Saratoga visitor, a great time to gape and stare at the rich and famous. The legendary Diamond Jim Brady (above), a heavy-handed bettor, turned up with 27 Japanese houseboys, one of whom pilfered so many of the large man's Havanas that he went into business for himself, once the entourage had returned to New York. Sometimes with Brady was actress Lillian Russell (opposite), often accompanied by a Japanese spaniel wearing an $1,800 collar. Brady, naturally, wore many diamonds—one of his evening outfits called for him to display as many as 2,548—which was considered the standard *comme il faut* badge of distinction for some gentlemen. On the long hotel verandas, where people rocked, gossiped or spent their time looking to see if that really *was* J. Pierpont Morgan strolling past, many of the day's truly big gamblers could be spotted plotting their next bit of action among the bookmakers at the track or with the croupiers at the Casino.

Not everyone, however, approved of the Saratoga life-style as much as did those who were enjoying it with such heady enthusiasm. Joseph Pulitzer's New York *World* sent up ace reporter Elizabeth Cochrane, who promptly used her well-known pseudonym of Nellie Bly to startle readers with stories about "Our Wickedest Summer Resort."

An 1887 picture of Lillian Russell, Brady's favorite track companion. Women put on weight to copy her.

Winslow Homer captured suspense among spectators in drawing published in *Harper's Weekly* in 1865.

The campaigns against gambling had their effect in due time. City management underwent an overhauling and housecleaning, the racetrack (which had gone steadily downhill under the shady manipulation of one Gottfried Walbaum) was reorganized by a syndicate headed by W. C. Whitney in 1901, and the reform movement even reached Canfield's Casino, which was ordered closed in 1907.

Today Canfield's Casino is a museum and historical society, but a few times a year an attempt is made to restore some of the past's brilliant glamour, even if just for one shining moment, à la Camelot. One such moment came last August when, on the eve of the 53rd running of the Whitney Stakes named for his grandfather, Cornelius Vanderbilt Whitney and his wife, Marylou (p. 44), tossed a Gay 90s gala beneath the Victorian chandeliers and the high stained-glass windows (p. 40). Less than 24 hours later Whitney's horse, State Dinner, captured the Whitney Stakes, the tenth time since 1928 that a family-owned runner had won the annual event.

When the reformers had cooled down and World War I was over, Saratoga, to the old regulars at least, appeared to be marching to a different tune. Oh, sure, plenty of celebrities (like Gene Tunney and Jack Dempsey) showed up, as did Harry Sinclair, Nick the Greek and Arnold Rothstein, but when it became apparent—as it did during the Thirties—that many of the popular new casinos were either owned or controlled by people with names like Lucky Luciano and Dutch Schultz, it was only a matter of time before their curtains would fall for the final act. Even at the track things were different, as just before World War II impersonal parimutuel machines replaced the colorful bookmakers.

Returning veterans and other would-be postwar revelers were greeted by crusading clean-up groups, the most powerful of which was headed by Senator Kefauver, who succeeded in shuttering the last of the casinos. A few years later the last of the great hotels, the Grand Union, was pulled down to make way for a shopping center. The name of its supermarket: the Grand Union. Saratoga looked dead.

But the battle-scarred resort, known for close to a

Off track, a "pony girl" gets to ride. Her job is to lead a horse and jockey to and from the racetrack.

century as the "Queen of the Spas," was far from buried. The nearby Saratoga Spa State Park was opened in 1935. Three decades later an event happened which would forever change the character of Saratoga summers. The Saratoga Performing Arts Center (SPAC) opened, and lured not only George Balanchine and the New York City Ballet but the Philadelphia Orchestra, as well, to spend a month each giving performances.

Governor Nelson Rockefeller broke ground for SPAC's spanking new semi-enclosed theater in 1964, and two summers later—aided by considerable Rockefeller money as well as hefty donations from a large segment of Saratoga's racing stable owners and local citizenry—SPAC opened in July with the ballet and a month later with the orchestra, with Eugene Ormandy himself on the podium. In addition to the theater (which seats 5,103 and can accommodate at least double that number on the lawn), there is also SPAC's John Houseman Summer Theatre, where a variety of groups, such as the old Juilliard Repertory Company, now called the Acting Company, stage their own dramatic productions.

And clear over on the other side of town, in fact adjoining the racetrack and the busy Northway, lies the 350-acre property of Yaddo (SMITHSONIAN, July 1977), once the estate of the Spencer Trasks, and bequeathed by the family in 1926 as a nonprofit institution which invites, shelters and feeds dozens of promising writers, composers, painters and sculptors for uninterrupted periods of study and work.

Healthy postwar progress was being made along the Thoroughbred racing front as well. The track, which had seen both good and shaky days under private ownership, was merged with New York's Belmont Park and Aqueduct to form the nonprofit New York Racing Association. Additional funds became available for much-needed building and improvements. Annual yearling sales moved up, too. In 1917, when the prestigious Fasig-Tipton Company (p. 44) first went into business in Saratoga, 383 head brought an average of $1,388. Now the averages are flirting with more than the $111,000 level, and the four-day sale each summer is second only to the highly selective July summer sale held at Keeneland in Lexington, Kentucky.

Another bonanza, this one for both the general public and the racing fraternity, was the state charter in 1950 to form the National Museum of Racing, Inc. After an early home in Canfield's old Casino, the Georgian-Colonial brick building was formally dedicated in 1955. Situated just across Union Avenue from the historic Saratoga racecourse, the museum is unique in that it is completely owned and privately supported by the sport of racing and receives no public aid whatsoever. The original collection of five sets of jockey silks, a few cups and trophies and about two dozen paintings has already grown to a collection of more than 250 silks, including those of the Queen of England and Sir Winston Churchill, and more than 350 paintings (p. 45).

After the day's racing program, one drives or walks (if he doesn't have to catch a bus) to a nearby cocktail party, quite possibly at The Reading Room, a private club on track grounds. Any excuse to have a party at Saratoga will do. Last summer the National Steeplechase and Hunt Association took over The Reading Room grounds to give a mild bash for a horse named Ben Nevis, just back from Liverpool where he (and his trainer Charles Fenwick) had won the English Grand National. As the champagne glasses rattled around his ears, the big jumper paraded about with noticeable skittishness. "He looks a little shook up," observed one bystander to a fellow member of the tweedy set. "And why wouldn't he be?" came the reply. "Horses, no matter what they have achieved, don't get asked to too many cocktail parties!"

In the misty dawn at Saratoga, an exercise boy works with a horse that may win that day, or may not.

Courtesy Elizabeth Starr and Fine Arts Center, Cheekwood

By Louise LeQuire

Edmondson's art reflects his faith strong and pure

Self-taught, uneducated, but wise, using cast-off limestone and chisels made from railroad spikes, he created timeless works

Louise Dahl-Wolfe

A head with the force of sculpture itself: William Edmondson, in work clothes; Nashville, about 1937.

When the new Tennessee State Museum opened this June in Nashville, it honored a native Tennessean, William Edmondson, with an exhibition of his sculptures. Running through September 15, the show was arranged by curator Jym Knight of New York's Mercantile Library.

When the Hirshhorn Museum and Sculpture Garden opened in Washington, D.C., in 1974, Edmondson was represented in the opening exhibition with a double figure, *Mary and Martha* (which is presently on exhibit in the second-floor sculpture hall). This work had made its way to an important museum of art—all the way from the backyard of a modest house in Nashville, Tennessee, where Edmondson worked steadily for almost two decades.

In the 1930s, William Edmondson's backyard was filled with stone carvings, all the products of a very personal vision. "First He told me to make tombstones; then He told me to cut the figures," Edmondson said. "I do according to the wisdom of God. He gives me the mind and the hand, I suppose, and then I go ahead and carve these things. . . ."

Today, carvings that William Edmondson sold for a few dollars, or gave to his friends, are owned and treasured by museums across the country and proudly displayed in Nashville gardens and drawing rooms.

A neighbor of his was Sidney Hirsch, who had much to do with the discovery of Edmondson's talent. Hirsch, a poet and mystic, had been one of the "Fugitives" in Nashville during the 1920s. This group of young poets and writers included Robert Penn Warren, John Crowe Ransom and Allen Tate, who often met at Hirsch's home to read and discuss their ideas. Another in this circle was Alfred Starr, later a successful Nashville theater owner, who, with his wife, Elizabeth, developed an interest in the sculpture of the black man who was Hirsch's neighbor. When the photographer Louise Dahl-Wolfe and her husband, artist Meyer Wolfe, visited the Starrs during the mid-1930s they were taken to meet Edmondson.

Mrs. Dahl-Wolfe found him a fascinating subject and made many studies of both the man and his sculpture (above and p. 55). Through her interest and her previous professional dealings with Alfred Barr jr., director of the Museum of Modern Art in New York (MOMA), arrangements were made for an exhibition of Edmondson's sculpture. The works were crated and shipped to New York and in October 1937 the exhibition opened; it was the first one-man show of the works of a black artist at MOMA. They received a favorable response from a sophisticated art world.

There was scattered interest in Edmondson works by artists and writers such as painters Arnold and Lucille Blanch, Alexander Brook, Gina Knee and Doris Lee; critic Selden Rodman; and the photog-

Figures carved from blocks of construction limestone have feeling of ancient archaic images.

Color photographs by Dan Carraco

William Edmondson's timeless art

Courtesy Elizabeth Starr

Three interlocking pieces, the top a retrieved upside-down fragment, form an ingenious *Birdbath.*

Courtesy the Reverend and Mrs. W. Henderson Barton

Angel, Miss Lucy was described by Edmondson as "upstanding angel" wearing "Robe of Righteousness."

rapher Edward Weston, who visited Nashville in 1941, several years after Mrs. Dahl-Wolfe had made her first photographs of the sculptor. But this flurry of interest had little impact on Edmondson. Almost four decades passed before a book about him was published, *Visions in Stone: The Sculpture of William Edmondson* by Edmund Fuller. In the period after 1937 during which the artist was able to work before he was slowed down by arthritis and found it more difficult to move the stones, his remaining pieces were scattered widely, many of them unrecorded.

Edmondson's carvings have appeared in many exhibitions of American art, and four good-size exhibitions were held after the New York show: at the Nashville Art Gallery in 1941, the Nashville Artist Guild in 1951, the Cheekwood Fine Arts Center in Nashville in 1964, and the Montclair (New Jersey) Art Museum in 1974. For the Cheekwood exhibit 116 pieces were

The author, a native resident of Nashville, has been an art educator, is a painter and writer and was an art critic for the Nashville Banner.

Courtesy Fine Arts Center, Cheekwood

Eve was one of Edmondson's rare "nudes," but with fig leaf and collared jacket. He kept it covered.

brought together. Between 1932 and Edmondson's death in 1951, several hundred pieces were carved and dispersed. They have made their way to the San Francisco Museum of Modern Art, the Abby Aldrich Rockefeller Folk Art Museum in Williamsburg, Virginia, the University of Rochester Art Gallery, the Hirshhorn Museum, and many others.

The date of William Edmondson's birth "got burnt up" with the family Bible, according to the artist, but we know he was one of six children born to former slaves in Nashville. His father died when William and his brothers and sisters were very young. He remembered that his mother picked crops or took odd jobs to keep the family going. Edmondson never married. He worked many years as a farmhand and a laborer at the railroad yards in Nashville, and from 1908 to 1931 as a janitor in Woman's Hospital. Around 1932, he turned to stone carving.

Edmondson used limestone discarded from demolished buildings. Wrecking companies would divert their trucks to his backyard and leave a pile of stones for a payment of a few dollars. He made his own chisels from railroad spikes, which he pointed or flattened on a hand-operated grindstone. The neighbors must have watched with curiosity and wonderment as he worked diligently in the backyard amid the varied array of his images, cutting away with the crude hammer and chisels, then filing or rasping for the finished forms; rabbits, turtles, doves, lions, rams, horses and people emerged from the cast-off blocks, making the yard a testament to his visions.

One of the most obvious elements of William Edmondson's artistic sensibility was the ingenious way in which he worked with what he had. Stones with basic rectangular and trapezoidal shapes gave impetus to his creations. Most of the figures of men and women convey a childlike quality with their stodgy proportions; several "maidens" are statuesque, however, with longer legs and smaller heads that approximate the classical norm, suggesting the artist's understanding of the limitations of his medium.

Some of the forms that the artist referred to as "critters" or "varmints" are strange beasts of a fertile imagination, never seen walking on Earth. When a friend asked to buy a five-sided piece that roughly suggested the form of a buffalo, Edmondson agreed to sell it as it was but added, chuckling, "I could have carved something beautiful out of that!"

Once when a visitor to the stone carver's yard asked to purchase a crow, Edmondson replied, with some indignation, that his birds were "doves, not crows." Birds were his most numerous subjects. As crowning members of gravestones, the birds sat delicately upon the geometric forms that once formed the parts of

Courtesy Mr. and Mrs. Walter Knestrick

Inspired by Biblical themes, Edmondson made animals, like this lion, and also created mythical ones.

Courtesy Mrs. Myron King

Sculpture of Eleanor Roosevelt with full-length cape followed Roosevelts' visit to Nashville in 1934.

buildings. In one graveyard on a hillside, at least 12 such birds looked out over the graves at one time. On Fourteenth Avenue, near the old sculptor's house, many birds were joyfully painted red by their owners. But in more recent years, marauders have stealthily removed them, leaving Edmondson's rectangular tombstones strangely incomplete.

The figure of *Eve* (p. 53), a gift of Mrs. Elizabeth Starr to the Fine Arts Center at Cheekwood, Nashville, is an impressive sight. She wears a large fig leaf to ensure her modesty, and her shoulders are textured with a collar and her arms covered by sleeves. Her ears are embellished with circular designs of striking size. Such an unusual concept for the Biblical persona of Eve follows no well-known precedent. One wonders whether an Oriental head at Sidney Hirsch's home might have stirred the imagination in this carving.

"Can't nobody do these but me," Edmondson said, and we can see the truth of his statement. Ralph Hudson writes: "Renaissance artists portrayed Eve as a more realistic female, but none produced an Eve that could say 'I am Eve' with any more conviction."

When Franklin and Eleanor Roosevelt came to Nashville in 1934, the motorcade passed by Edmondson's house on Fourteenth Avenue. Mrs. Roosevelt smiled at everyone as the President waved. Soon after that, Edmondson put his memories and impressions of her into the more permanent medium of stone. He carved a regal version of Eleanor, standing firmly in a full cape, with a long braid of contrasting texture hanging down her back (left). He prized this sculpture especially, keeping it protected beneath an overhanging shed in the yard. When art dealer Myron King asked if he could purchase it, Edmondson said, "Oh no, Miss Eleanor's not for sale. I want her here with me where I can look at her!" Later he did at least one more version, and then he was ready to sell. King promised him that he could come to see the sculpture whenever he pleased, and later on he did drive the elderly artist out to his place several times to view the work along with others in its garden setting. "Lord, Mr. King, you is a millionaire!" Edmondson said, referring without timidity to the beauty of his own works in their new setting.

The American eagle became a favorite subject for the sculptor at one time. He said that he carved these in gratitude to the federal government while working for a brief period with a small stipend from the WPA program for artists.

An upstanding angel, rightfully clothed

In the carving that he called *Angel, Miss Lucy* (p. 52), Edmondson created an "upstanding angel" and referred to her garb as "The Robe of Righteousness." The wings are conceived as protruding from the back of a heavy-textured cape, which begins on the head of the figure and flows around the shoulders to the feet, recalling a nun's robe. A Nashville artist, Marie Barton, watched him carve this figure to its completion, and she recounts that watching him work directly with simple tools inspired her own work in stone sculpture. Another Nashville artist, Bertha Herbert Potter, visited Edmondson repeatedly and purchased some of his finest works.

Puryear Mims, sculptor and professor of art at Vanderbilt University, wrote in a tribute to Edmondson: "Today he is a part of our world. His images are omnipresent. They tease us out of heart. They say to us as they did to Will Edmondson, 'I am locked in a stone. I am locked in a heart. Let me out—let me out.' "

Edmondson described his brush with the angels as a "swish of wings fluttering up under the eaves of my house." At other times he described them talking to him from various positions. After he had seen the angels, there was nothing to do but carve their images in stone. For Edmondson the experience was a tangible one to be recorded as seen. The Lord put his model in the sky and ordered the artist to copy it.

In answering queries about his work, he might give tongue-in-cheek answers, such as the story Louise Dahl-Wolfe recalls him telling about the "Germany woman, lifting her skirts out of the mud." His ladies are sometimes quite haughty—"uplifted," he called them. But others he seems to ridicule by placing them on stools, starkly recalling the indignities of the hospital where he formerly worked. The quiet undercurrent of humor in many of Edmondson's works turns the typical gravestone heart into a spade and the lamb into a ram.

But the serenity of an Edmondson angel keeping vigil over a grave is the sculptor at his best. The variety of these pieces is endless. The primitive directness of the forms and gestures, arms folded or holding an object, carries a powerful message. Edmondson did several Crucifixions, each different in posture and overall form. His preacher raises his Bible in the air; his lawyer clutches the Book of Law close to his chest; a schoolteacher holds a pocketbook and a mother cuddles her child.

William Edmondson was a devout believer in the Primitive Baptist faith. To know the source of his vivid Biblical frame of reference, one has to consider the vitality of his church rituals. A preacher in such a church is a speaker of powerful rhetoric, a singer leading his congregation in a crescendo of religious fervor, from amen to amen. Edmondson once told a Nashville reporter in an interview that he longed for the day when he could "preach for my Daddy. I love his heart." But just now, he felt, it was not permitted. "Every time I try to read the Bible, or preach, the Lord takes my mind off it and tells me I got work to do," he said. To express in stone the Bible's great themes with a special power—this was William Edmondson's calling, "the Lord working His will through my hand."

The sculptor's hand rests on one of his birds, feeling its surface. He called them mourning doves because he made them specifically to adorn the tops of tombstones, which he sold to the black community.

Louise Dahl-Wolfe

This is how much car you should expect for $14,000 today.

From the second-largest carmaker in Europe comes the Peugeot 505 S. So high is its quality–and so well is it equipped–that some observers think it may well be undervalued in today's market.

A car with steering that "knows" when to step in and help the driver in difficult situations...

A car with highly sophisticated dampening devices that treat bumps and potholes with contempt...

A car whose spark plugs are tipped with silver and whose ignition is by magnetic pulse. Result: a fuel-injected engine that is designed to shrug off tune-ups for 30,000 miles...

A car that delivers fuel economy without requiring you to downgrade to a small, lightweight car...

A car whose seats glide back and forth on tiny rollers instead of simple metal slides; you may not find more comfortable seats in any production car today...

A car which is not permitted to leave the factory until it has been subjected to a complete road trial by an expert test driver...

Such a car is the Peugeot 505 S.

Steering that "thinks"

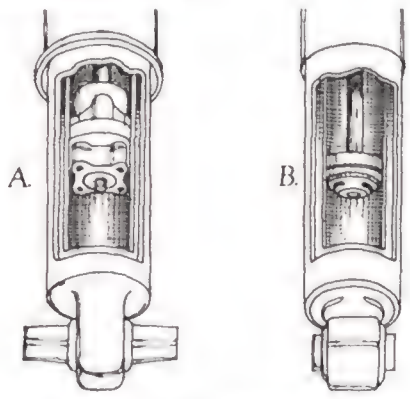
Power steering can be both a blessing and a curse. Without it, a heavy car can bring beads of sweat to your brow as you try to wrench it out of a parking spot. But most power steering takes over so much of the work–is so overpowering–that it can take away control from the driver. A particularly hazardous situation on slippery roads.

The Peugeot 505 S steering, on the other hand, has *graduated* power assist. It "knows" when to step in and help the driver...and when to step back.

Exert a lot of turning force on the steering wheel, and the power unit will feed-in all the help you need. But when the steering lightens–at cruising speed, or if the road is slippery–it automatically cuts back on the power assist. The steering is never insensitive, never numb. You "feel" the road through your hands, "feel" the amount of grip that the tires have on the road. You have an extra margin of control.

The heart and soul of the car

Ask Peugeot engineers to name yet another vital element of the 505 S, and they will point to the shock absorbers.



A. The Peugeot 505 S rear shock absorber, showing complex valving. This enables unit to achieve the difficult feat of performing like two different shock absorbers –one for ride comfort, the other for handling.
B. Cadillac Seville rear shock absorber, for comparison only.

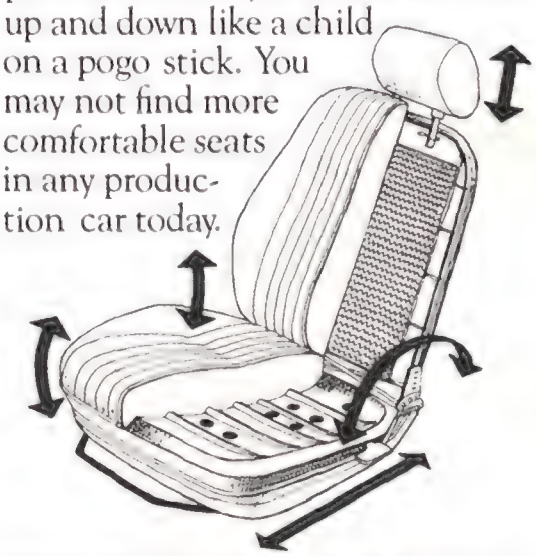
These awesome dampening devices have pistons that contain *four times as many valves* as normal shock absorbers. They smother road shocks to such a degree that the Peugeot 505 S glides serenely over bumps both large and small.

Where lesser shock absorbers might be expected to show signs of weakening after 30,000 miles, the Peugeot shock absorbers have been designed to maintain their peak efficiency for 60,000 miles of normal use.

Sinfully comfortable seats

In its almost fanatical pursuit of comfort, Peugeot has thrown accepted wisdom out the window: it has abolished springs from its seats.

Springs can sag during their life; Peugeot has replaced them with polymerized foam. Springs can produce oscillations that actually disturb one's stomach; Peugeot has tuned the foam to work in coordination with the car's suspension so that you do not bounce up and down like a child on a pogo stick. You may not find more comfortable seats in any production car today.



Peugeot has banished seat springs in favor of polymerized foam. Seat adjusts for tilt, angle of seat cushion under thighs, and driver's height from floor.

The Peugeot steering system "reads" slippery road conditions, cuts back on power assist so driver retains feel of the road.

Rear-seat passengers are not neglected, either.

Thanks to the long, 107.9-inch wheelbase and sensible use of space, this is a *true* 5-seater. Be sure to try the back seat. Like the front seats, it has been contoured to the shape of the human body by experts in physiology. You will find room for adult knees. And adult heads.

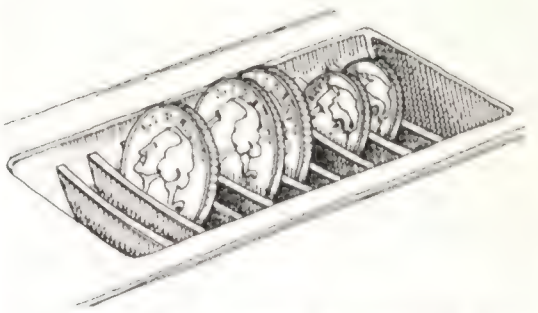
As owner after owner has discovered, this is a car which makes it possible to survive a long day's drive without arriving saddle-sore and in a state of ill-tempered exhaustion.

Brakes that "read" themselves

No car is a totally safe car. To pretend otherwise would be glib sophistry. Nevertheless, Peugeot places great emphasis on striving for that perhaps-unattainable goal.

The body of the Peugeot 505 S has been designed with sections that fold into each other to help absorb impact before it can reach the car's occupants.

Rust-resistant zinc-galvanized steel is used on areas of the car where metal failure could be dangerous—such as the points where the suspension is mounted to the body.



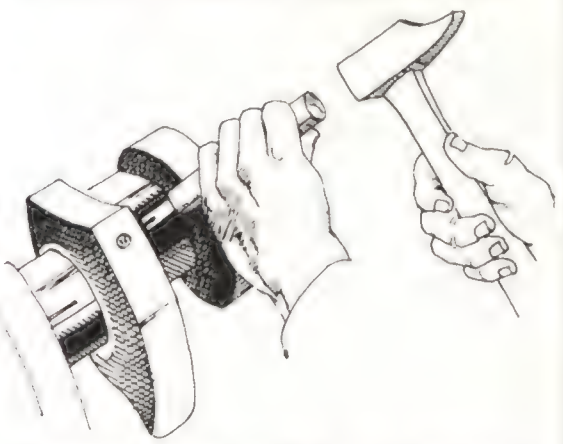
Coins for tollbooths have their own little slots.

Should a fuel line ever be severed, the flow of fuel is automatically shut off.

The brakes on the Peugeot 505 S are *disc* brakes—*on all four wheels*—because discs shed water and dissipate heat faster than drum brakes. An ingenious device "reads" how conditions are affecting the rear wheels—is the car in a hard-braking nose dive, is the car heavily loaded down in the rear with luggage? If necessary, pressure to the rear brakes will automatically be corrected to help prevent the rear wheels from locking and skidding.

The mania of Peugeot

There is a story floating around Peugeot that concerns a group of visiting English journalists. They were watching the torture testing of an engine, a process so closely monitored by computer that, at the first



Peugeot workers sign-off on their handiwork at every important stage. Here, a man hammers his symbol into a crankshaft.

sign of trouble, the engine is automatically shut down before it can destroy itself. (The reason: it is often impossible for engineers to analyze a part—and redesign it—*after* it has blown itself to smithereens.)

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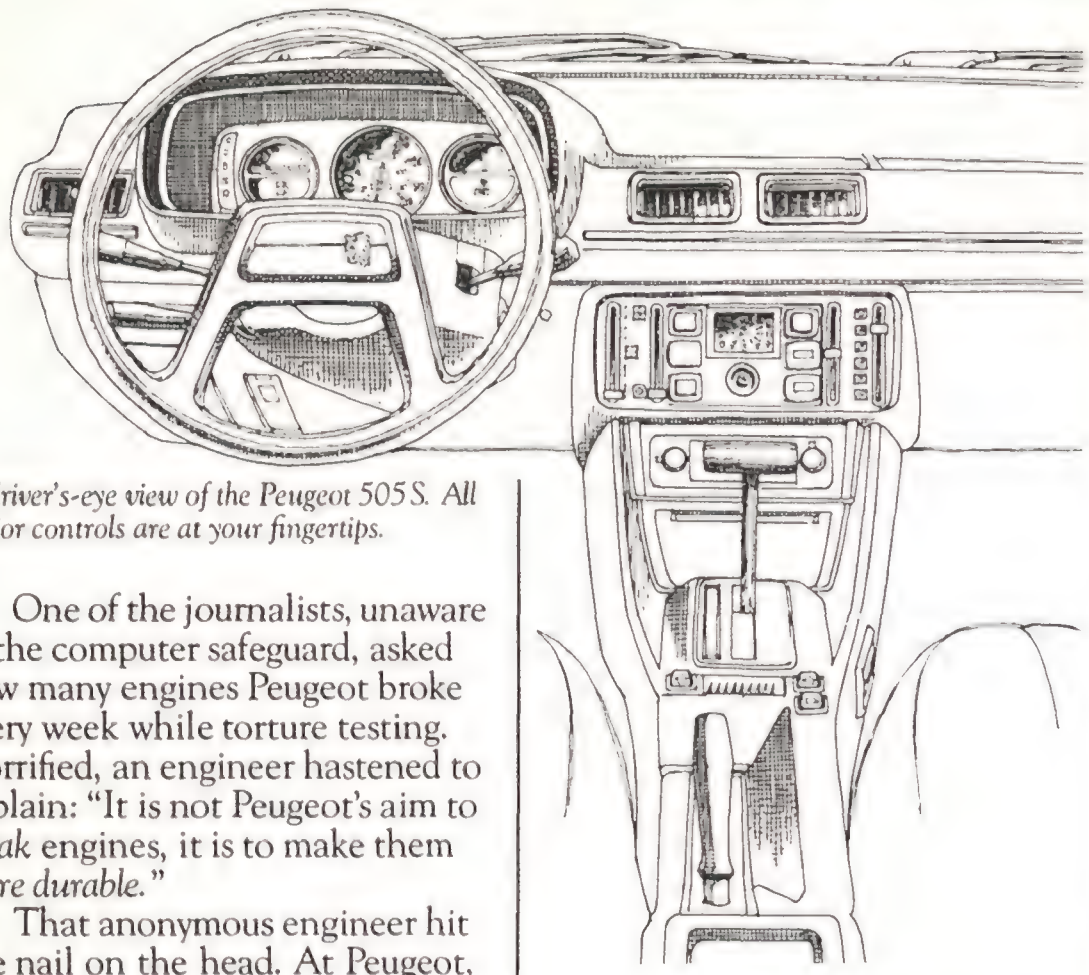


A driver's-eye view of the Peugeot 505 S. All major controls are at your fingertips.

One of the journalists, unaware of the computer safeguard, asked how many engines Peugeot broke every week while torture testing. Horrified, an engineer hastened to explain: "It is not Peugeot's aim to *break* engines, it is to make them *more durable.*"

That anonymous engineer hit the nail on the head. At Peugeot, there is an almost maniacal reverence for that much-overused word, quality.

Peer at the door hinges of the Peugeot 505 S. You will see that they are machined from hot-rolled steel. Peugeot does not feel that its owners will tolerate doors that sag on their hinges later in life.

At every important stage in the making of the car, the men and women of Peugeot sign-off on their handiwork by stamping their own symbol on every major component.

The testing is exhaustive; the various procedures would fill a book. One small example: There is a room at Peugeot where a man does nothing but check gearboxes. If there is the faintest noise that shouldn't exist, back goes the gearbox for correction.

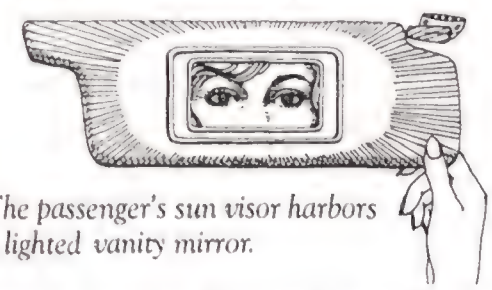
The Peugeot Lion

The lion has represented Peugeot since 1858. It was Peugeot that built the first car ever sold commercially (1891)... the world's first diesel-powered car (1922)... and the first high-rpm diesel engine (1967).

Silver-tipped plugs. And an exhaust "sniffer"

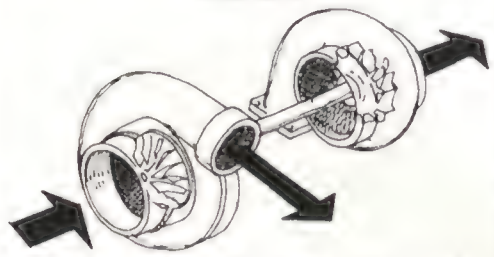
It is Peugeot's view that cars should not require constant, annoying trips to the shop for tune-ups.

The XN6 Bosch-fuel-injected engine that propels this ton-and-a-half car to almost 100 miles per hour (there are no speed limits on some roads in Europe) would take still another book to describe. But one high-technology detail: there is an on-board computer that "sniffs" the exhaust gases, instantly analyzes them, and then orders the fuel-injection system to tune itself for the most efficient and most pollution-free mixture of fuel and air. The system is so efficient that the XN6 engine passes both the Federal *and* California emissions standards.



The passenger's sun visor harbors a lighted vanity mirror.

"Free" extra power: the Peugeot turbocharged diesel



A tiny turbine blows a 600-mph whirlwind that literally packs the engine of the Peugeot 505 Turbodiesel with power.

The result is the best of both worlds: more passing power, yet the miserly thirst of a diesel engine. Thirteen percent more horsepower than the normal diesel. With 28 EPA estimated mpg, 36 estimated highway mpg.*

The source of this extra power is free. The turbocharger is driven by exhaust gases that would otherwise be expelled through the tailpipe and disappear into thin air.

A bonus for city drivers: the Peugeot Turbodiesel engine uses 75% less fuel at idle than a gasoline engine.

Important note: Peugeot diesel engines are *true* diesels, designed from scratch to withstand the enormous internal pressures. They are *not* converted gasoline engines.

The ignition is by magnetic pulse; there are no points to replace.

The spark plugs are no ordinary spark plugs; they are tipped with silver.

It should be no surprise to learn that the Peugeot 505 S is designed to take you 30,000 miles between tune-ups.

The meaning of "S"

Peugeot does not believe in nibbling you to death with extra-cost options. When you spend $13,520 for a gasoline-engined 505 S, this is the "S" (for Special) equipment that comes with the car:

- Factory-installed air conditioning
- Electric sunroof • Cruise control
- Electric windows • Digital AM/FM

Peugeot EPA Mileage Ratings

Model	Estimated Mpg	Estimated Hwy Mpg
505 Turbodiesel	28	36
505 Diesel & 504 Diesel Wagon	28	34
505 Gasoline	18	28

Manual transmission. Use EPA estimated mpg for comparison purposes. The mileage you get may vary with trip length, speed, weather, and condition of car. Actual highway mileage will probably be less.

stereo radio with Seek/Scan tuning and four speakers

- Automatic electric antenna
- Central door-locking system—a twist of the key locks all four doors
- Alloy wheels
- Multi-adjustable driver's seat.

So fully equipped is the car that the only other ways to spend your money are by ordering a 3-speed automatic transmission ($360) in place of the 5-speed overdrive manual gearbox, and by specifying metallic paint ($290).

Someone has driven your Peugeot

Check the odometer when you take delivery of your Peugeot and you will discover that someone has already been driving it.

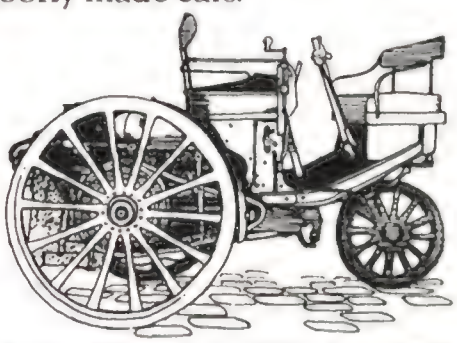
Be pleased. It is yet another telltale of quality.

Peugeot maintains a 75-member team of test drivers whose job is to take every car after it leaves the assembly line and give it a final test on a special test track.

The driver will test the steering, brakes, lights, engine performance, transmission, and suspension. Listen for rattles and vibrations. Check the instruments and controls. Try the heating and air-conditioning systems.

A rarity today, this final road testing costs a small fortune. Peugeot, with a shrug, accepts the expense as indispensable in maintaining quality.

Peugeot has little tolerance for poorly made cars.



The first Peugeot car, 1889. A newspaper called it "a diabolical invention to make our poor horses lose their heads."

The car that is a benchmark

This, then, is the Peugeot 505S. It is made in Europe. It is designed for safety and tested for durability. It is inordinately comfortable.

It is how much car you should expect for $14,000 today.

Peugeot Cars—from $15,510 to $10,990

Peugeot 505S Turbodiesel	$15,510
Peugeot 505S Gas Fuel Injection	13,520
Peugeot 505 Turbodiesel	12,980
Peugeot 505 Diesel	11,990
Peugeot 504 Diesel Wagon	11,660
Peugeot 505 Gas Fuel Injection	10,990

See your dealer for details of Peugeot's limited warranties.

Based on P.O.E. manufacturer's suggested retail prices. Actual prices may vary according to local dealer. Destination charges, state and local taxes, dealer preparation, if any, and license fees are extra. Automatic transmission optional at extra cost.

For name of nearest Peugeot dealer, call **1-800-447-2882** toll free in the continental U.S. In Illinois, 1-800-322-4400.

Please send me the Peugeot Facts Kit, complete with brochures, road tests by leading car magazines, plus list of my nearest dealers.

☐ Please include details on Overseas Delivery

Name_____

Address_____

City_____

State_____ Zip_____

Peugeot Motors of America, Inc., One Peugeot Plaza, Lyndhurst, New Jersey 07071

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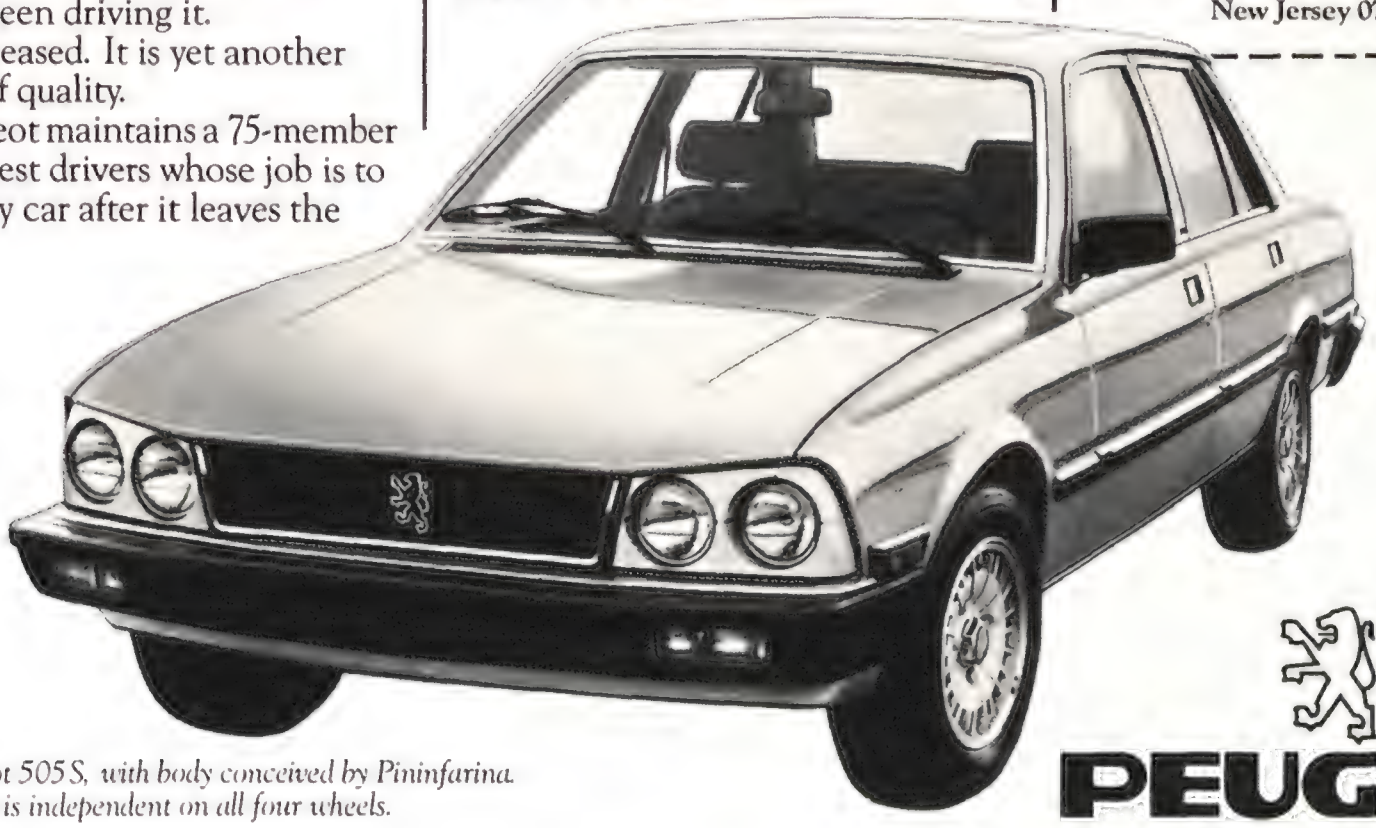

The Peugeot 505S, with body conceived by Pininfarina. Suspension is independent on all four wheels.

PEUGEOT

© 1981, Peugeot Motors of America, Inc.

Painting *Hands Up* depicts robber who allegedly held 12 men at gunpoint simultaneously. Undercover Pinkerton agent was wrongly accused of robbery.

By Frederick S. Voss and James G. Barber

Pinkerton brought law and order–19th-century style

The saga of this pioneering detective comes alive through pictures and memorabilia in exhibition at National Portrait Gallery

Anyone guessing at Allan Pinkerton's future as he grew to adulthood in his native Scotland in the late 1830s would have thought that the youth's prospects for fame and fortune were slim indeed. Born the son of an impoverished former weaver turned police sergeant and reared in the cheerless slums of Glasgow, Pinkerton was by age 20 scraping out a living as a barrel maker. Two years later, his involvement in worker agitation for political reform in Britain had produced a royal warrant for his arrest. With hardly enough time to wed his sweetheart and pack his meager belongings, he and his bride were soon on the high seas headed for sanctuary in North America, landing first in Canada but later moving on to Michigan and finally Illinois. So it was that Allan Pinkerton, whose celebrated detective agency would make his name synonymous with the forces of law and order, began his life in the United States.

At the outset, however, the future for this penniless fugitive from British justice seemed of a more modest kind. Settled by 1843 in Dundee, Illinois, Pinkerton set about making his way in the New World doing what he knew best—manufacturing barrels. In a few short years, his sober industry had won him a thriving trade. Then one day in 1847, the Dundee cooper set out on a routine excursion that would alter his life.

Finding himself on that day short of wooden hoops and staves, a barefoot Pinkerton left his little manufactory to replenish his lumber supplies from trees found on a tiny, supposedly uninhabited island in a

nearby river. In the course of completing his mission, he came upon the remains of a seemingly well-used fire. As he cast his keen eye over this evidence of human activity, instincts quite apart from barrel making came to the fore. Suspecting that there might be something illicit taking place here, Pinkerton returned several times by day for another look about. Then, under cover of night, he went back again. This time, cautiously concealed in tall shore grass, he saw several silhouetted figures bent over a fire. That was enough for Pinkerton: a few evenings later, he and the county sheriff were rowing out to confront the island's late-night denizens. Soon the citizens of Dundee were learning how Pinkerton's alertness had led to the capture of a band of coin counterfeiters.

Shortly thereafter, when merchants of the town discovered that someone was passing them bogus bank notes, they naturally turned to neighbor Pinkerton for help. The solution to this new problem in crime detection required a bit more patience and guile, but Pinkerton was up to it.

Allan Pinkerton left Scotland a fugitive and became America's most famous 19th-century detective.

Pinkerton becomes a detective

In the wake of this second success, Pinkerton recalled years later, "I suddenly found myself called upon from every quarter to undertake matters requiring detective skill." In 1848, by now decidedly more preoccupied with crime solving than barrel making, he readily accepted when the sheriff of Cook County asked him to come to Chicago to serve as a deputy. A year later, his good reputation earned him appointment as Chicago's first full-time police detective. But Pinkerton's talents seemed to demand an even larger arena of operation. In 1850, he established, with Edward A. Rucker, a young attorney, his own private detective agency—the North-Western Police Agency.

One of the first of its kind in the country, Pinkerton's detective enterprise thrived from the start. In 1856, having the previous year signed a lucrative contract to protect the property of several Midwest railroads and with requests for his services growing daily, he reported to an old friend of Dundee days: "I am overwhelmed with business." By decade's end, his clientele had become national in scope. The first 50 years of Pinkerton's National Detective Agency, as it was later renamed, is the subject of a Smithsonian National Portrait Gallery exhibition that runs from July 31, 1981, through January 3, 1982.

In part, Pinkerton's quick success grew out of the circumstances of the times. In an age when there was no centralized federal police agency and when local police forces were usually undermanned, often corrupt, politically dominated and frequently disinclined or unable to pursue the fleeing criminal into jurisdictions other than their own, it was soon apparent that Pinkerton's agency filled a crucial need. While constables and sheriffs tended to call off the chase once the wrongdoer had gone to other climes, Pinkerton was ready, willing and determined to stalk his prey, if necessary, from one end of the country to the other. Moreover, as the agency's geographical range of activity broadened, its dossiers on known criminals multiplied and thickened. By 1860, Allan Pinkerton's offices were rapidly becoming an indispensable clearinghouse for all manner of information on criminal activity.

It was not just historical happenstance, however, that explained Pinkerton's quick rise to prominence. The fact was that Allan Pinkerton was a most remarkable detective. A peculiar amalgam of sober diligence and fertile imagination, he seemed, on the one hand, to be simply a stern and able administrator as he issued instructions to his operatives. But Pinkerton's prosaic businessman's exterior belied a creative intuition which, once set in motion, could point to the solution of a crime well before a shred of hard evidence had surfaced. Then, too, there was Pinkerton the actor, and, as the case of the moment demanded, this abstaining, staid Scot could by turns don the pose of a bon vivant or a humble day laborer. In one such

Robert Pinkerton, sensitive and soft-spoken, almost left agency because of his father's domineering ways.

Courtesy Chicago Historical Society

Allan Pinkerton (standing to left of pole) poses with operatives and officers at Antietam, Maryland, in 1862.

instance, it must have seemed to onlookers that the train conductor most certainly was confused as he slapped handcuffs on a seemingly respectable man rather than on the tattered tramp (Pinkerton in disguise) collaring him.

This was the stuff of which legends were made, and, by the 1870s, the staring, unblinking eye and phrase "We Never Sleep," which for many years served as the Pinkerton trademark, had come to embody a meaning that transcended mere professional competence. As tales of the agency's exploits spread, it seemed that the onetime fugitive from the British police had found a place in the nation's lore: Allan Pinkerton may not always have got his man, but, in the public mind, it seemed that way.

Almost from the moment he set foot on American soil, Allan Pinkerton had been an arch opponent of Southern slavery. In the decade preceding the Civil War, his conscience apparently was never troubled by the curious contradiction that, while his agency's reputation rested on strict adherence to the law, he was secretly, and quite unlawfully, engaged in providing aid to runaway slaves. In any event, when the sectional disputes over slavery were on the verge of erupting into armed conflict in 1861, Pinkerton predictably stood foursquare for the Union cause, and he was soon making the resources and talents of his agency available to the federal government.

Even before the guns of war had exploded in open hostility, Pinkerton was on the trail of rebel conspirators. In February 1861, Pinkerton learned of an alleged plot in Baltimore to assassinate President-elect Abraham Lincoln as he passed that way on his journey to Washington for his March 4 inauguration. Fearing the worst, the cautious detective helped to persuade Lincoln to travel through secessionist-minded Baltimore under the protective veil of night. In the waning hours of February 22, 1861, Lincoln, wearing a soft felt hat and a long overcoat, left Harrisburg, Pennsylvania, aboard a special train for Washington, where he arrived safely early the next morning.

Shortly after the April 12th attack on Fort Sumter, South Carolina, Pinkerton concentrated his detective activities in the Confederacy's border states, where he and his agents gathered intelligence about Confederate strengths and operations. In August, just after the

Frederick S. Voss and James G. Barber are research historians at the National Portrait Gallery, for which they organized "We Never Sleep" exhibition.

Secret service was organized by Pinkerton for General McClellan after Union defeat at First Manassas.

William Pinkerton took after his father—relishing the chase, tracking criminals with dogged determination.

Union defeat at the first battle of Bull Run, Pinkerton went to Washington to officially organize and head a secret service for General George Brinton McClellan's new Army of the Potomac.

It was in the sultry capital that the bearded detective soon became sidetracked by a woman who was to test his equanimity in a way he never could have anticipated. Her name was Rose O'Neal Greenhow and her major activity that summer was spying for the Confederacy, which she did with remarkable success. Mrs. Greenhow was perfect for this sort of intrigue. At middle age, she was cultured and was considered by many to be one of the most influential women in Washington. Her high social standing, combined with her charm, allowed her easy access to prominent politicians, from whose aides and clerks she wooed many government secrets. Thanks to her surreptitious efforts in early July, General Pierre G. T. Beauregard, Confederate commander at Manassas, received word from her of the planned Union advance on Bull Run.

By the end of August, Rose Greenhow had become enough of a nuisance and threat that the administration authorized Pinkerton to arrest her. He surprised the petticoated agent at her house on 16th Street, introducing himself as Major E. J. Allen, his wartime alias. Mrs. Greenhow knew better, however, a tribute to her guile. It didn't work for her this time, however. At first, Pinkerton kept her under guard in her own home—a tactic which led to the arrest of a number of her visitors and the cracking of the spy ring. Later, she was confined within the walls of the Old Capitol Prison (p. 65), where she continued to employ her charms. With the Confederacy's renowned mistress-spy in custody, Pinkerton continued his intelligence gathering—somewhat less successfully—for the Army of the Potomac until November 1862, when he resigned as Chief of the Secret Service. Following the Confederate surrender, he returned to Chicago to resume the work for which he was best suited: private investigation.

By the late Sixties, Pinkerton's two sons, William and Robert, both of whom had worked with their father during the Civil War, had joined the firm. Although the older Pinkerton often consulted his sons on agency problems, there was, nevertheless, no doubt about who stood at the helm. "I rule my office with an iron hand," Allan Pinkerton once wrote in a letter to a new employee. *"I must have my own way of doing things."* For his sons, this arrangement was not altogether satisfactory. Whatever the problems of working under an authoritarian parent, William and Robert,

each in his own way, clearly had a good deal of the detective in him. When the destiny of the Pinkerton organization finally fell into their hands on the death of their father (1884), they proved themselves able administrators. By the turn of the century, the agency's business and reputation were global. It continued to expand, operating under four generations of Pinkertons, and is today still very much a thriving enterprise.

In the 1870s Allan Pinkerton had met with both disaster and success. In 1869 he suffered a near-fatal stroke that partially paralyzed him for several years, and significantly curtailed his involvement in the business. Two years later, the great Chicago fire destroyed his home office—a $250,000 loss, Pinkerton claimed. A decline in business throughout the nation, culminating in the severe depression of 1873, left Pinkerton groping for work and wondering how he would pay his agents. Amid the prevailing doom, opportunity opened up in the anthracite coal region of eastern Pennsylvania.

In this economically depressed area, inhabited largely by Irish immigrants, mine workers and owners frequently battled over wages. Strikes were common. They severely crippled the hard coal industry, in which the Philadelphia & Reading Railroad had a major stake because of its freight monopoly. Its president, Franklin B. Gowen, never liked to see the cars of the Reading standing empty and idle or, worse yet, to hear that striking miners, angered by his attempt to lower wages and increase production, had destroyed railroad property. Gowen had long suspected that secret societies of Irish immigrants were responsible for these depredations. In 1873, he hired the Pinkertons to infiltrate the area. Their preliminary investigation of the burning of a coal tipple at Glen Carbon, Pennsylvania, first connected this violence with the name "Molly Maguires"—a name more often whispered than spoken in the dingy mining communities.

Further investigations disclosed the Molly Maguires to be a clandestine organization of Irish-Catholic

Charles "The Scratch" Becker, forger, had a long torso and short legs.

Maximilian Shinburn, safe cracker, was dapper and well-spoken.

Sophie Lyons, a pickpocket and jewel thief, "never went back on a friend."

miners who had banded together, under the pretense of Christian brotherhood, to avenge purported wrongs committed against any of its members. Allan Pinkerton, judging this case to be unique, realized the need to send a special type of operative to the troubled coalfields. His man had to be both Irish and Catholic, the two conditions necessary to gain entry into the Mollies' inner circle. After careful consideration, Pinkerton chose James McParlan, a 29-year-old Ulster immigrant, for the extraordinary assignment.

On October 27, 1873, McParlan, posing as an "itinerant tramp," and using the assumed name of James McKenna, arrived in the coalfields, where he began a two-and-a-half-year investigation of the Mollies. With a bit of luck and plenty of deft playacting, the red-haired Irishman quickly gained the confidence of several key leaders. Six months after his arrival McParlan accepted an invitation to join the Molly Maguires.

As an initiated member, McParlan's situation became precarious at best. Having earned the Mollies' trust, he soon found himself pegged to commit sabotage and murder. Somehow, either by clever alibi or by just plain good fortune, he always managed to escape involvement without raising suspicions.

As murder led to more murder, McParlan doggedly stayed with his accumulating pile of cases. Then, in February 1876, a jury convicted a Molly of killing a policeman in Tamaqua, Pennsylvania. This first conviction broke a pattern of Molly "justice" that had

Mathew Brady photographed Rose Greenhow and daughter little Rose at Old Capitol Prison in 1862.

Adam Worth was considered the "Napoleon" of international crime.

Charles Bullard, "Piano Charley," was skilled pianist and safe burglar.

Frederick Wittrock robbed only once, but asked to be called "Terrible Fred."

Mug shot became important tool for police after Civil War, though criminals proved reluctant models.

usually resulted in delays, fixed juries and eventual acquittals. When a captured cohort turned state's evidence in the Tamaqua case, he implicated others who were subsequently arrested for one murder or another. In the midst of this roundup the Mollies began to suspect McParlan of being the "loose screw." On March 7, 1876, shortly after escaping one assassination attempt, McParlan fled the area, only to return reluctantly two months later to testify in the sensational murder trials that ultimately resulted in the conviction and subsequent hangings of 20 men.

Not all of the services the Pinkertons performed were of an investigative nature. With the Industrial Revolution came organized labor, and strikes ultimately followed, at which point industrial managers hired Pinkerton agents to protect their property. In 1892, that was the case in Homestead, Pennsylvania, where striking Carnegie steelworkers battled Pinkerton guards, leaving a number dead and many wounded. The Pinkertons' involvement in this labor dispute, as in others, left them with a tarnished name among the working class, a name that the agency attempted to rectify through its success in tracking bank robbers, forgers and Western outlaws.

The methods employed by Pinkerton agents in tracking criminals were as varied as the criminals themselves, and in some respects presaged modern police techniques. On one occasion, the tracing of a hat to its place of purchase might be the key needed to locate the wrongdoer. On another, it might be a minute follicle of hair or a medical prescription inadvertantly left behind by the criminal. In still other cases, it was the almost magic ability of the Pinkertons and their agents to remember a face. Once, on hearing the verbal description of a burglar-murderer, Robert Pinkerton was able to inform the local police exactly who the man was. The Pinkertons' thoroughgoing persistence, of course, played a crucial part. Like the many artful criminals found on file in their offices, they too were masters of their craft.

The rogues' gallery

By 1900, police forces in this country and abroad had come to rely heavily on Pinkerton's massive store of information on known lawbreakers. It was all there in the Pinkerton files: Charles "The Scratch" Becker, forger par excellence, whose handiwork could undergo "microscopic scrutiny" and still remain undetected; Adam Worth, the "Napoleon" of international crime and chief orchestrator of everything from diamond heists in South Africa to bank forgery in Turkey; Charles Bullard, alias "Piano Charley," the skilled pianist who was just as deft at robbing banks. The list was endless—enough plots and characters to last a writer a lifetime.

During the last three decades of the 19th century, as train and bank robbery became an ever-increasing phenomenon in the frontier West, Pinkerton's proved itself readily adaptable to the demands of boots-and-saddles law enforcement. In fact, the agency's operatives played a part in trailing almost every notable bandit—including Jesse James, who eluded them, and Butch Cassidy and the Sundance Kid, whom they chased all the way to South America. By the time this colorful saga in American criminal history ended, the name Pinkerton was as intertwined with the legend of Western banditry as the outlaw himself.

The agency's Western files also contained many a rogue who never achieved notoriety—men such as the mild-mannered storekeeper Frederick J. Wittrock, who liked to pass his idle hours reading about the lawless in dime novels. After a while, Wittrock began to wonder if he, too, might have the makings of a swashbuckling bandit. One day in November of 1886, masked in a black bandanna, he walked into an express office near St. Louis, brandished a gun and exited with a small fortune in cash and securities.

Wittrock's yearnings, however, were for fame rather than fortune. Within 24 hours, he had sent the inside story of his accomplishment, as well as a few pertinent

You can see it in every Thunderbird ... that unmistakable reflection of the distinctive and daring heritage of a unique line of cars.

And yet Thunderbird is thoroughly contemporary. The lines are crisp, the stance, bold and assured.

Inside the plush interiors and the electronic magic of an optional digital speedometer and electronic fuel gauge make Thunderbird a distinctive driving environment.

Thunderbird's optional 4.2 liter V-8 engine equipped with optional automatic overdrive produces a highway estimate of **28*** and an EPA estimated MPG of **18**. A 3.3 liter 6-cylinder engine is standard.

Most important, Thunderbird has remained true to what first made it great ... Thunderbird drivers, people who appreciate style and flair and expect it.

Buy or lease a 1981 Thunderbird and ask about Ford's Extended Service Plan.

It's good to know the thunder's still there.

THUNDERBIRD

FORD DIVISION Ford

*These figures are for comparison. Your mileage may differ depending on speed, distance and weather. Actual highway mileage lower.

The Thunder's Still There.

clues, to the newspapers. Following up on these helpful hints, Pinkerton agents and police were soon knocking at his door. As they led him away, the soft-spoken Wittrock asked if henceforth they would please refer to him as "Terrible Fred" (p. 65).

Over the years both William and Robert Pinkerton came to feel an almost paternal concern for certain of the outlaws their agency had chased. When bank thief James (Jim) Dunlap, whom the Pinkertons had captured in the mid-1870s, finally got out of prison, William staked him for a venture into saloon keeping. Unfortunately, he was soon back practicing his old trade. Then there was Sophie Lyons (p. 64), pickpocket (from age six, she said), jewel thief and colleague of many a bank robber. In 1894, after serving one of several jail terms, she was in Detroit operating the Great Western Matrimonial Bureau. "She claims," William Pinkerton noted in an office memo, "she has settled down. If so, she ought to be encouraged." Shortly thereafter, the agency received word that Sophie was being investigated for mail fraud!

Mixed with the Pinkertons' affectionate interest in some of their criminal acquaintances was a concern for history. When William Pinkerton heard that the eminent safecracker Maximilian Shinburn, alias Baron Shindle (he had paid for the title), was living out his last days at a home for reformed criminals in Boston, he asked Shinburn to record some of his more original methods for breaking into a vault. The result was a meticulously hand-illustrated treatise which Pinkerton added to Shinburn's already sizable dossier.

Robert Pinkerton died in 1907 and William in 1923. On both occasions, the tributes to their respective contributions to the cause of law and order were many and glowing. Of Robert, one noted thief sentimentally observed: "He was a square one." A few years after William's death, a member of the underworld wrote: "When Bill Pinkerton . . . went after a man he didn't let up until he had got him." Perhaps these accolades from members of the agency's rogues' gallery would have been the ones Allan Pinkerton and his sons would have liked best.

Undercover Pinkerton operative James McParlan (kneeling) is initiated into Molly Maguires. As James McKenna, he infiltrated clandestine group thought responsible for violent acts against mine owners.

Shell Answer # 27 Series

ENERGY COUNTDOWN

How we can buy time until other energy sources are ready.

by Dr. Charles S. Matthews, Shell Senior Consulting Engineer

Come to Shell for answers

S1

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We depend on oil and gas for nearly ¾ of our energy. Read how finding more oil and gas in America can buy the time to fully develop other energy sources.

It's been eight years since the Arab Oil Embargo.

In those eight years, you probably haven't seen a single newspaper or news broadcast that didn't say something about an energy problem. "Crisis," "shortage," "price hike." People began to feel like there was only one kind of energy news—bad.

Well, there's no denying that the energy problem is real. But there's also no denying that American resourcefulness and American know-how have already begun to do something about it. There's been a renewed faith in America's ability to solve its tough problems. Energy is one of those problems. But it's a problem that the country has already started to solve.

The questions and answers in this guide tell about that solution.

Q. Are we really running out of oil and gas?

A. No, not immediately.

There's still a lot of oil and gas left in the ground in the United States—probably about as much as we've used so far. Of course, the supply isn't unlimited.

Q. Does that mean there's no more energy problem?

A. No, there's still a problem.

Even though there's a lot of oil and gas in the ground, we're not getting enough out. We have used up oil and gas from old wells faster than we've found new oil and gas to replace it. So we have become dangerously overdependent on foreign suppliers. That's the real problem.

And if we ignore that problem, it will get worse. During the next ten years, there is simply no way to reduce our need for oil and gas by large amounts.

Q. So how do we reduce this dangerous overdependence on foreign oil?

A. We must do three things.

One: We must continue to conserve energy.

Two: We must increase our use of coal by about 50 percent between now and 1990.

Three: We must work very hard to find oil and gas at home. *Very* hard. Just to keep it flowing at the *same* rate for the next ten years, we must find three times as much new oil as was found on Alaska's famous North Slope.

All three things are critical. And all three things are possible. If we fail at any one, our dependence on foreign supplies will continue to be dangerously high.

WHERE WILL OUR ENERGY COME FROM?

The barrels show energy consumption and energy sources. If we conserve more, make more use of alternate energy sources, and find more oil and gas at home, we could be using less imported oil and gas in 1990 (right barrel). If we don't, imports will actually be higher in 1990 than they are now (center barrel). In either case, we'll still be dependent on oil and gas for most of our energy in 1990. (Figures are millions of barrels of oil per day that would yield equivalent energy and have been rounded to the nearest 100,000 barrels.)

Lift these advertising pages out by removing staples.

Q. If we conserve like mad, couldn't we get along with a lot less oil and gas?

A. No. Conserving energy will help, but even with *excellent* conservation, the U.S. energy appetite will continue to grow for a while.

In 1990, we'll have 21 million more people in this country and 18 million more jobs. We'll actually need 12 percent *more* energy than we need today.

Part of that energy must come from oil and gas. The question is: Where will the oil and gas come from? The smart thing to do is get more and more from sources in the United States, less and less from foreign suppliers.

Q. Why don't we switch to other energy sources, like solar?

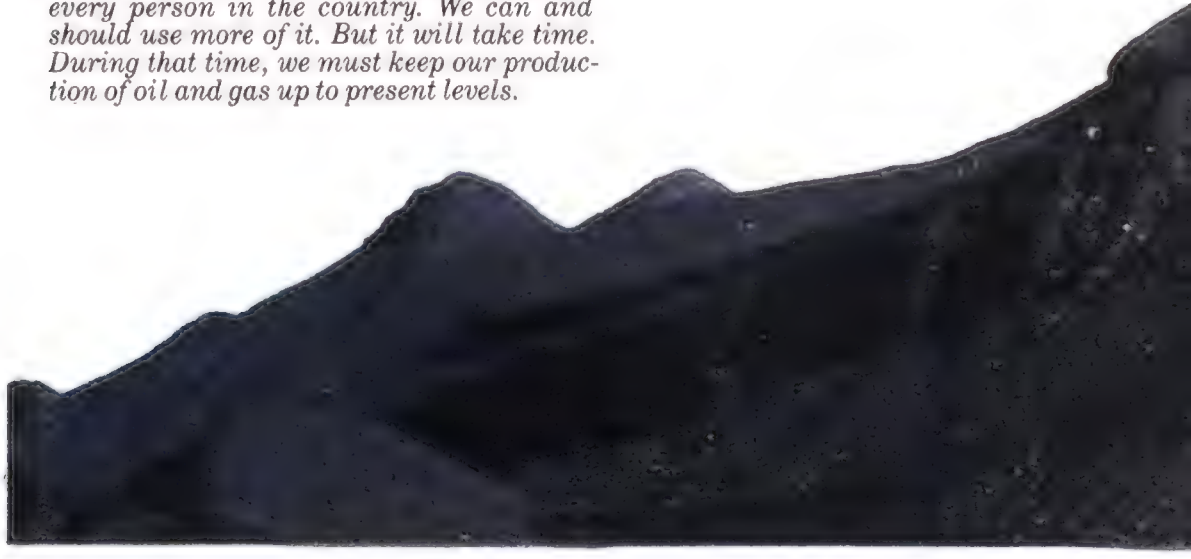
A. We are switching. And as the other sources are developed—solar, nuclear, coal—they can supply most of the *additional* energy the country will need.

But the other sources can't be brought in fast enough to supply that additional energy *and* make up for a decrease in oil and gas. So even though we're switching to other energy sources, we'll still need about as much oil and gas in 1990 as we need today. There's no way to change that.

What we *can* change is where the oil and gas come from. By 1990 we could be getting a bigger share of them from sources inside the U.S.

This solar collector gathers 25 percent more sun energy than previous models did. Here at Sandia Laboratories in New Mexico, researchers hope to eventually produce a collector cheap and efficient enough for widespread use in factories and power plants.

Coal is America's energy ace in the hole. There are about 1,100 tons in the ground for every person in the country. We can and should use more of it. But it will take time. During that time, we must keep our production of oil and gas up to present levels.



Q. If we use nuclear power, could we get along with less oil and gas?

A. It will help take care of some of the *increase* in demand. But it won't reduce our need for oil and gas.

Nuclear plants now provide 3.3 percent of our energy.

If all the new plants that are planned were given the go-ahead and construction started tomorrow morning, they could only bring the total up to about 9 percent by 1990. That's it.

And it's already too late to plan on additional nuclear plants by 1990. Counting time for the environmental studies and licensing, it takes more than ten years to finish a nuclear plant.

Q. Couldn't we get along with less oil and gas if we used more coal?

A. Coal is the most promising alternate source. One-fourth of all the coal in the world is within our borders. But, as with nuclear and solar, we can't increase our use of it fast enough.

Before we can start burning more coal, we have to install the equipment that burns it. Thousands of power plants and factories that now burn oil or gas will have to put in new equipment to burn coal. Pollution controls must go in, too.

Even if the changeover goes well, coal will only take care of 27 percent of our energy needs by 1990, up from 21 percent today.

We'll still need about as much oil and gas as we need now.

Lift these advertising pages out by removing staples.

Q. Why haven't oil companies been getting us more of that American oil and gas?

A. Because a lot of the oil and gas—probably 70 percent of what's left—has been off limits. It lies under Federally controlled land or ocean bottom.

The government controls approximately 44 percent of all the land in the United States. Oil companies have had very little access to that 44 percent.

Hundreds of millions of acres were kept off limits while studies were conducted to see if they should be set aside as wilderness areas and the like. Incredibly, the studies did not include any exploration to determine how much oil and gas might be under the land.

During the 40 years since offshore drilling started, only about 3 percent of the offshore area has been leased to oil companies by the Federal Government.

Potential oil lands were fenced off with red tape. An enormous amount of energy could be locked beneath Government land. America can no longer afford to leave it there while you pay for foreign oil to replace it.

Q. Why did the Government keep oil companies off Government land?

A. Because some people believed they were protecting the environment by restricting exploration and drilling. Shell thinks it's possible to protect the environment *and*

Fish are attracted to offshore oil platforms. They feed on the tiny marine creatures that grow on the platform structure. It's time to stop thinking in terms of energy or *environment. With today's pollution controls, we can have both. We* must *have both.*

get the oil and gas, too.

And this is true not only for land exploration and drilling, but for offshore as well.

In U.S. waters, modern offshore techniques have cut water pollution to near zero. Platforms actually *attract* marine life.

Out of 23,000 wells drilled during the last 40 years, there have only been three major spills. And even those left little evidence of any damage to the environment.

Q. Is Shell saying oil companies should be allowed to drill anywhere?

A. No.

But oil companies should be allowed to drill where the promise of oil and gas is greatest and the proper environmental precautions can be taken. The track record, both onshore and offshore, shows we can get the oil and gas out without abusing the environment.

And the oil and gas potential

An Offshore Oil Timetable

Geophysical surveys made in frontier areas.

Environmental studies made. Government leases awarded.

Government permits obtained. Exploratory drilling begins.

Offshore platforms and drilling equipment ordered.

Platform installed. Drilling under way.

Peak production reached.

We can't wait until the oil wells are running dry to go after new ones. We must continue to develop American oil and gas if we are to have a safe supply in 1990.

of a land area should be evaluated *before* that area is set aside as a wilderness or a wildlife preserve. If there's promise of oil and gas, the public may still want to set it aside. But then the decision would be based on the facts.

Q. Should we be optimistic about our energy future?

A. Yes. The outlook is good.

The Federal Government now recognizes the need to open up more land for oil and gas exploration and speed the leasing of offshore areas.

And there are other promising signs. In 1980, sixty thousand wells were drilled in this country, 20 percent more than the year before. And new recovery techniques are making it possible to get more oil out of old fields. It's expensive, but it's a secure domestic supply.

In addition, increased conservation efforts by the American people have helped reduce the amount of oil we import.

These things don't mean the problem is solved. We're still overly dependent on foreign supplies. But these are good signs, signs that we can make it if we try.

About the Author

During his 37 years with Shell, Dr. Matthews has published more than 50 technical papers, he has co-authored a widely read petroleum engineering textbook, he has been a Distinguished Lecturer to the Society of Petroleum Engineers, and he has been awarded seven patents.

In his role as an energy expert, Dr. Matthews has appeared before numerous congressional committees and Federal agencies and on national television.

A Ph.D. graduate of Rice University, Dr. Matthews is currently chairman of the American Petroleum Institute's Reserves Committee. His work at Shell today centers on finding ways to get more oil out of each well.

Which unleaded gasoline is right for your car?

Shell has two answers.

Shell Super Unleaded Gasoline, in the red pump, is for cars that need a premium unleaded gasoline with extra octane. It can help keep those cars from knocking and running on. It helps prevent hesitation and stalling, too, because it's blended for good driveability.

But not every car needs the superior quality of Shell Super Unleaded.

Maybe your car will run just fine on the lower octane of Shell Unleaded. About half of the cars that need unleaded will.

If you don't need the difference in octane, why pay the difference?

Come to Shell for answers

By Robert C. Gildart

Roaming their last domains, grizzlies may clash with Man

The upper and lower jaws of a bear believed to have killed a man last year rest next to bitten books.

As more hikers share the same backcountry with bears, trouble is almost inevitable; last year three Glacier Park campers died

High on a mountain meadow in the heart of Glacier National Park a humpbacked bear stirred. At first it moved slowly and agilely down a water-carved depression. Then suddenly, with long strides that churned up sod beneath its lethal claws, muscles rippling under its thick frost-tipped fur, it fled—continuing its flight even after it reached a thick clump of alpine fir and then finally disappearing from sight.

From astride our horses on a slope drenched with lupine, glacier lilies and harebells, we could hear the snapping of twigs as the bear plunged on, still intimidated by its unexpected confrontation with two of its relatively diminutive fellow Earth inhabitants.

Ours was a three-day journey, and during the course of that 1978 summer pack trip, then-Superintendent Phillip Iversen and I had seen five different grizzlies. Each of these huge beasts had responded just as do "99 percent" of all grizzly bears when they encounter humans—it ran.

But occasionally wilderness wanderers encounter a very different type of bear. And then the public wonders, "What went wrong?" or "What can be done?" Last summer two grizzly bears didn't run, and three people were killed.

In the first 1980 case, the bodies of Kim Eberly and Jane Ammerman were discovered by two fishermen along a creek bed near a tourist town adjacent to Glacier Park. In the second, the remains of Lawrence Gordon were found at a backcountry campsite where he died alone. The only evidence left of Mr. Gordon was his skull, pelvis and a few other bones. Afterward, instead of just wondering what went wrong, many people responded to the second question, "What can be done?"

"Glacier National Park is attempting to accomplish the impossible," wrote a concerned citizen. "Glacier Park cannot be both a grizzly bear preserve and a heavily used hiking area. You must make a choice to be one or the other." Park managers and most bear biologists do not agree. Guided now by the recommendations of the two boards that gathered information on Glacier's three 1980 deaths, they believe they can strike a compatible medium between Man and bear. But considering the three maulings, it is little wonder the public is growing impatient.

Is the National Park Service really doing its job? Can we preserve the national parks for future generations so that they will represent our pristine heritage—including the grizzlies—as required by the Congressional mandate of 1916?

I've been an employee of the National Park Service for 13 summers, riding the trails for several of those years as a backcountry ranger. During that time, I've seen 76 grizzlies and, with one exception, my encounters stirred up awe and admiration for this huge omnivore. But there is that one gruesome exception. In 1967, I helped load the mutilated body of a young woman into a death sack. Later, I returned to shoot the creature as it charged from a distance of 30 feet.

My immediate reaction was one of anger and frustration, similar to that of Lloyd Smith Parratt, an Olympic National Park naturalist who was mauled in 1960 when he was ten years old. "Why me?" said Smitty. "I didn't do anything." Today, 26 plastic surgery operations later, Smitty is frank. "Because of my experiences I wouldn't feel comfortable in an area where there are grizzlies—I feel sorry about that—but

This is one of the last shots on a roll of film taken by Michael Quinton of a charging grizzly, the end of a six-hour stakeout. Quinton was not injured, but did leave the scene, he said, with all deliberate speed.

These footprints are those of the bear in the preceding picture and of the photographer, who later returned.

I don't want to see the bears eliminated in Glacier, either. It's one of the last strongholds of this magnificent creature left in America."

That the grizzly bear represents an integral part of our American heritage is beyond question. American Indians not only learned to coexist with the grizzly, but they deified it. Their rituals prescribed that they apologize to the great mammal before killing it.

With the arrival of the white man, the life of the bear began to change. Early explorers, such as Lewis and Clark, chronicled the activities of the "white bears" on many separate occasions. During their two-year sojourn, members of the expedition killed at least 43, and from that time on the grizzly's kingdom began to crumble. Where once it had roamed the plains west of the Mississippi, most were gone by the 1920s.

Most settlers had considered the big bears a scourge interfering with the raising of cattle. Bounties were paid, and they were hunted like vermin. Today, the domain has practically diminished to two of our national parks, Yellowstone and Glacier, and areas surrounding these "reservoirs," where there are maybe 1,000 left, probably fewer. But even in these areas, they are being squeezed from their habitat as a rising number of visitors flock to the parks and inhibit the grizzly's freedom of movement.

The bulk of the North American grizzly population, difficult to count, lives in Alaska and Western Canada. Dr. Stephen Herrero, professor of biology and environmental science at the University of Calgary, gives what he calls a "seat of the pants" estimate: 15,000-20,000 for Canada, and 10,000-15,000 for Alaska. Even in the more remote Denali National Park in Alaska, where the grizzly population is estimated around 300, the encounters between people and bears are on the increase and are considered by chief naturalist Bill Truesdell "a serious concern." Said Truesdell, "Ten years ago we didn't have that kind of activity but as we have more visitors, we have the potential for some serious problems. We've had bears approaching people in the backcountry and raiding camps for food."

Although in the past Indians killed grizzlies for food and clothing and the earlier whites slaughtered them to reduce their numbers, neither produced any radical change in the bear's natural avoidance of Man.

The practice of modifying the grizzly bear's behavior was reserved for inhabitants of more modern times who established garbage dumps and created lightweight backpacking equipment manageable by virtually anyone drawn by the wilderness. The results have been to bring people and bears closer together.

Historically, garbage has had the most profound effect. In 1872, Yellowstone National Park was created and with it began a problem that, years later, would generate the need for a specific Bear Management Plan. The biggest mistake was to permit the creation of garbage dumps. Hotel managers would place garbage adjacent to their establishments to attract wildlife for the amusement of visitors. Records indicate that the hotels had the tacit approval of Yellowstone National Park supervisors and that at least the acting superintendent in 1902 acquiesced in the procedure. Nevertheless, he recognized an incipient danger when he wrote, "Whenever a bear becomes vicious or dangerous at any hotel or station throughout the park, the fact should at once be reported, and a scout will be specifically detailed for the purpose of capturing or killing it."

Different approaches to bear management

Perhaps the most famous controversy in the history of wildlife management involved bears and garbage dumps in Yellowstone. Two well-known wildlife researchers, Frank and John Craighead, began a study of the grizzly bears there in 1959. After studying as many as 900 grizzlies over 12 years, they urged the Park Service to phase out dumps slowly, to avoid making the bears marauders that would then have to be shot. The Park Service stuck to its decision to close the dumps "cold turkey," and after bitter argument, the Craigheads' research was terminated in 1971.

Their approaches were different, but their concern was the same: reestablishment of a wholly wild grizzly population with an all-natural diet, for the sake of both Man and bear.

The first bear-caused death in Yellowstone had been recorded years before, in 1907. A tourist prodded a grizzly cub in a tree with his umbrella; moments later

Bears feed at dump outside town of West Yellowstone, Montana, in Gallatin National Forest. The dump has since been enclosed by an electric fence which appears to be working. Garbage disposal remains a problem.

the sow fatally mauled the man. In 1916, a man died after he was dragged off by a grizzly that had been raiding camps for several weeks.

At the time, many authorities felt the killing was out of character for grizzlies. The guilty bear was destroyed, but nothing was done to the garbage dumps and, by the 1930s, feeding bears the refuse from hotels had become an institution. Bleachers were erected and the bear show became a favorite park attraction. In fact, for many years it was considered an asset serving to attract people from all over the world.

As the years went by, however, park officials expressed concern that dump grounds would one day constitute a lethal hazard. That "one day" arrived on an August night in 1967.

Sixty years after Yellowstone experienced its first grizzly bear death, Glacier National Park experienced "the impossible." Two young women were killed on the same night in two different valleys. One died near Granite Park Chalet, where grizzlies were baited with garbage so Chalet guests could get a closer look.

The other incident occurred at Trout Lake, a backcountry campground, exquisite but for the garbage left behind by thoughtless campers. One week after the mauling, Ruben Hart, Glacier's chief ranger during those days, and I returned and gathered 17 burlap sacks of refuse.

Following Glacier's first deaths, both Glacier and Yellowstone implemented plans to separate people and bears. All bears, since the plans cover both grizzlies and black bears. These smaller cousins, which are found in parks in the East as well, may not be as dangerous but they can cause a lot of problems. They're inquisitive, there are more of them and they are apt to become overly familiar with Man, his belongings and his food. "The grizzly is more of a loner," said Glacier National Park management assistant Joe Shellenberger, "and tends to exhibit territorial defensive behavior. The out-and-out attack-type thing that can occur with a grizzly usually doesn't occur with a black bear." But black bears can be a real nuisance, tear up camps or cause injuries to people who cross them. "Tourists try to feed them by hand, or a bear will take a picnic basket and the person will try to take it back and get hurt," he said. "We just had to destroy two black bears that had become too used to people and their food." The evidence against the bears was based on ranger and tourist reports, and one already had been relocated once and tagged as a troublemaker.

Glacier's Bear Management Plan, revised annually, prescribes that anyone who sees a bear report it to a park official, noting the time and location of the sighting, the bear's color and size, and its personal disposition: aggressive, retiring, fearful, placid, etc. If reports

Montana writer Robert Gildart works summers as a backcountry ranger in Glacier National Park. He wrote for SMITHSONIAN *on elephant seals (April 1978).*

of an aggressive bear begin to accumulate, an investigation is made. The reports also assist biologists in analyzing movements of the bears.

In Glacier these movements vary with the seasons. Sometime in November the grizzlies begin their hibernation in dens located on north- and east-facing slopes at elevations generally above 5,000 feet. In April, they emerge from their dens. Some head for snow-free slopes, others for rivers, places where they expect to find food. They eat grasses and carrion such as goats killed by avalanches. By early June, in mating season, the bears are likely to be moving to remote areas at higher elevations. During the tourist season, in the absence of garbage dumps, they move into subalpine feeding areas and begin to fatten up. In the fall, they disperse throughout the park, not confining themselves to any specific location. They feed on buffalo berries, roots and an occasional elk.

Very few visitors ever see a bear, much less encounter one. Because of this they often are incensed by the literature pressed on them. "Why," they ask, "is Glacier trying to scare us to death?" The reply is usually couched in calming phrases, as it should be: "Well, the park is attempting to counter the 'Gentle Ben' syndrome. And then there's this thing called the Federal Tort Claims Act. . . ."

That 1964 law allows the public to sue federal agencies. To warn visitors of the hazards, the Bear Management Plan prescribes no fewer than ten pieces of printed material advising that indeed Glacier is grizzly bear country. Signs depicting vicious bears are everywhere: on outhouse doors, at trail heads, beside roads —little is exempt. Pamphlets, too, are dispensed: one "bear alert" flyer projects from the top of all other literature distributed at entrance gates. Naturalists incorporate information about bears into their lectures.

In general, the information tells you to make noises while hiking, to keep food items in closed containers, and to hang food well away from campsites. Women are cautioned not to hike while menstruating. If a bear is encountered, the advice is not to run as this may excite the animal, and a human cannot outrun a grizzly. If a tree is available, and there is time, climb it; otherwise, slowly back away. If the bear attacks, as-

Bear expert Charles Jonkel examines the teeth of a tranquilized grizzly in his research in the Glacier area.

At right is a snare set at Snyder Lake Campground in Glacier; many bears are too wary to be caught.

sume the fetal position and play dead, difficult as that sounds. It worked for park ranger Steve Fry who, when he was a teen-ager, was hiking in Glacier and found himself so close to a grizzly that he didn't have time to head for a tree. He dropped immediately next to a log and lay still while the bear sniffed him head to toe. "The situation was so incredible that I hardly had time to think about being terrified," he says.

Keeping track of the grizzlies

Rangers like Fry are required by the Bear Management Plan to conduct regular bear patrols in their respective areas. As a backcountry ranger from June 1 through Labor Day, I do the same, alert for signs of bears—scats, paw prints and churned up sod, a sign that bears have been digging for roots or small mammals. If I see a sign, I investigate to try to assess the extent of the bear's activities and where it is spending its time. Then, in most instances, I will post the trail head advising hikers of the bear's presence. If I see a bear, I report it to the communications center.

For a number of seasons, I have worked out of a valley near East Glacier Park where once it was necessary for me to close a large portion of the valley to hikers. My log recalls the circumstances:

> ". . . rode to Pitamakan Pass. Just above Katoya Lake saw a grizzly bear that immediately took flight. Bear was about 350 pounds, black with silver-tipped hair. Continued on down trail and moments after sighting, horse became very nervous, swinging head from side to side trying to look behind. Turned around in saddle and not more than 30 feet behind was a grizzly advancing toward us. Stopped horse, grizzly took off but moments later, reappeared. Again I stopped horse and this time the bear departed for good. Horse never bolted. Closed trail later in day. Warm day with little wind."

One week later I reopened the trail, but only after watching the bear for several consecutive days through binoculars as it placidly grazed on grasses and roots across a large lake away from the trail and campground. Several weeks later, the campground was moved down the trail, farther from this prime grizzly bear habitat.

For a number of years the Bear Management Plan appeared to be working. But in 1976 a girl was killed in a car campground in the heart of the populated Many Glacier Valley. That illustrated another problem. Not only does garbage contribute to fatalities but the inevitable contact bears have with people produces a potentially lethal condition called, in official jargon, "habituation." From 1950 to 1980 the number of people visiting the park annually swelled from 500,000 to more than 1.5 million. Compound this increase

A more elaborate apparatus, an aluminum culvert trap, is flown out of a campground after unsuccessful try.

with the approximately 20,000 who register for permission to use Glacier National Park's backcountry overnight campsites each summer and the hordes of daytime hikers, and the stage is set for reinforcing "habituation."

Habituation has long been recognized as a problem confronting parks having garbage, bears and large numbers of visitors. Managers have attempted to alleviate the problem through a process known as "aversive conditioning." This concept is designed to reinstill fear in bears and is a stated Glacier National Park research objective.

The idea is to employ some stimulus that will condition bears to either refrain from coming to garbage dumps or run at the sight of people. Many possibilities have been tried, so far without success: creosote, electric prods, mace, tear gas and even rock salt fired from shotguns. At Cut Bank Ranger Station, where I have served for several summers, my predecessor tried the last. "Blasted one several times from a distance of 20-30 feet," says Kerel Hagen. "Loud boom associated with some pain. But it never worked. Within half an hour the bear was right back near the campground."

Two of the three people mauled in Glacier National Park last summer were killed by a garbage-habituated bear, similar to those involved in the 1967 deaths.

Though the dump involved, known as the St. Mary dump, was located about one-quarter mile outside the park on the Blackfeet Indian Reservation, it was common knowledge that grizzly bears from the park had been frequenting it.

In the St. Mary area it was well known that bears

Steve Bracken, park ranger, closes Snyder Lake Trail to hikers because of bears in this backcountry area.

were creating problems. About a mile outside the park, the *Hungry Horse News* reported, a bear killed one of Shelbie Woodward's pigs. At St. Mary's townsite, perhaps 100 yards from the park, lodge owner Hugh Black lost a pig to a bear. On July 3, rangers attempted to trap a dark-brown grizzly at the dump. The bear was also seen on July 4, but as the board investigating the fatalities of 1980 notes, because the bear "appeared shy of the trap" and because of the busy holiday weekend, the trap was removed.

In previous years, other bears had been seen in the St. Mary area, and in the late Seventies, Dr. Charles Jonkel, an internationally recognized authority on bears, tried to have the dump closed. "I tried to emphasize the magnitude of the problem but the park advised me it was out of its jurisdiction," said Jonkel. "At the time, response from the reservation was no better. It was apathetic." The St. Mary dump is now closed but as of this writing an "undetermined" number of dumps are still located almost immediately adjacent to the park's boundary.

The first of Glacier's 1980 tragic incidents involved Kim Eberly and Jane Ammerman. They were killed on July 24 by a dark-brown grizzly. The two had decided on their own to remain overnight in an area not specifically authorized for camping. According to the board of inquiry appointed to consider the incident, the campsite was "on the most logical route for bears moving between the park and garbage sources outside the park." Not surprisingly, the offending bear was later shot in the same area.

"... they would not have been killed"

The board also provides further comments regarding the couple's camping:

> "Had they indicated an intent to camp in the St. Mary area in other than one of the designated campgrounds, it is likely they would have been informed that a grizzly bear had been visiting the [St. Mary] dump. . . . Had Mr. Eberly and Ms. Ammerman been responsive to information received during their orientation (they were both concession employees) and adhered to park regulations, they would not have been killed."

Kim Eberly and Jane Ammerman were camped on a sandbar in the middle of a small creek less than six feet wide. Pushing through a clump of willows on a warm spring day, I found the spot. In spring the tourists were gone, but, still, I could hear the occasional roar of a vehicle as it hummed along the nearby highway. Occasionally, muted voices could be heard.

About half a mile away was a now-deserted campground. A short distance in the other direction was the tourist town of St. Mary. Time slipped by as the

A grizzly mother nurses her cub in a meadow. Species has one of the lowest reproductive rates of any mammal in North America, and a female may produce only six to ten offspring in her lifetime.

warm sun engulfed me and for a moment I was mesmerized by drips from the exhausted winter creek. But this was early spring and the sudden flutter of a bird taking wing gave me a start. Thirteen years ago, three other men and I had found the mutilated body of Michele Koons on just such a day when birds sang and life seemed to surge.

In the second 1980 incident, circumstances were different. The bear believed to have killed Lawrence Gordon had a history of aggressiveness. It had been trapped in 1978 and moved from the populated Many Glacier Valley over the Continental Divide to Valentine Creek, a distance of about 30 miles. In 1980, according to park biologist Cliff Martinka, the bear returned to Many Glacier Valley. On either September 26 or 27, it killed Lawrence Gordon at nearby Elizabeth Lake.

Following the Gordon death, another board convened. This one advised Glacier to reevaluate what constitutes a problem bear. Previously, overtly aggressive behavior was necessary before a bear was considered a problem. This board suggested that the park take a harder line on any bear that has torn up camps, eaten other than natural food, or simply become overly familiar with humans. The board advised that such bears should be trapped and immediately removed—either transplanted or killed.

The board also suggested that the availability of natural food for the grizzlies should be evaluated periodically. This belief is predicated upon the assumption that bears tend to be more troublesome when food stress exists. Expert Charles Jonkel adds that the condition of bears should also be assessed. This information can be gathered from the animals tranquilized by rangers and researchers. No Monday-morning quarterback, Jonkel warned on radio, prior to the discovery of Gordon's death, that conditions existing in northwestern Montana were "volatile." He argued, "When food is scarce and the condition of bears is poor, these animals begin to wander and seek out new areas having adequate sustenance. During these times Glacier authorities should manage their domain by excluding people from certain areas."

The Gordon board also believed that the transplant program could be improved. If it were necessary to capture a bear, the board said, it probably would be "troublesome enough [for us] to seriously question if it should be transplanted within the park." Preferably, other agencies should take the bear; if this is not possible, the bear should be destroyed. This advice

was given with knowledge that Glacier National Park's grizzly bear population of about 200 appears to be stable.

This stability is a very tenuous thing. Grizzly bears have one of the lowest reproduction rates of any mammal in North America. During the course of a lifetime, a grizzly female gives birth to from six to ten cubs on the average, and many of these will not live to adulthood. For these reasons, bear managers are reluctant to shoot a grizzly.

Since 1967 the park has killed 15 bears for management purposes—slightly more than one a year. This year, things may change. At least that's what the new, improved, 1981 Bear Management Plan says, for the park has accepted all but one of the recommendations made by the Ammerman-Eberly and Gordon review boards. The one exception is that the park will not insist (although it will suggest) that lone backpackers be accompanied by other hikers. Gordon had been a lone hiker.

All other recommendations are now an integral part of the 1981 Bear Management Plan. The park is taking an active catalytic role on garbage disposal sites in areas adjacent to government land. It is beginning to monitor the availability of the natural food of the grizzlies and their general condition. During times when the bears are under stress, the park is prepared to exclude people from specific areas. The Bear Management Plan accepts that, in certain circumstances, troublesome bears should be killed.

Will this plan absolutely separate humans and grizzlies? No. But then, where do we find any such guarantees? Certainly not in Glacier, where grizzlies have contributed to six of the park's 150 deaths from its opening in 1910 through the Gordon death last September.

If the public considers this fraction an unacceptably large number and insists on access to every last one of Glacier's valleys, then the only alternatives left are to construct huge hurricane-type fences around backcountry campsites, provide armed escort service for the public—or totally eliminate the grizzly.

For one who thrives on freedom and firmly believes that the original Congressional mandate of 1916 should be preserved, none of these solutions would be acceptable. Instead, I believe we should be willing to accept the continued improvements in a plan that can provide a good probability of increased protection. Now all the plan needs is proper implementation and a compassionate public—one willing to give this creation of the ages a brief reprieve.

But for the grizzly bear it is very, very late in the day. I remember once when I encountered a pair of littermates near Glacier's Surprise Pass. Twilight was creeping in along the trail and moments earlier an elk had bugled into the crisp September air. A leaf swirled to the ground and just as silently, two grizzlies rounded a nearby bend in the trail. An evening zephyr stirred and carried with it some secret message. Sensing intrusion, one of the bears rose on its hind feet, the other followed suit.

Instinctively, I stood. With incredible speed the bears dropped to all fours and whirled. Muscles rippled, sod churned, branches whisked. Run, I thought, run before you are lost.

An adult moves along a Glacier Park trail. Fur color ranges from blond to black with pale, grizzled tips.

Three-month-old cub will have a struggle to reach adulthood. Despite fierce mothers, many do not make it.

LTV. Looking Ahead

Has America's technology lead slipped? Industrialist and educator agree, yes. Disagree as to why

INFLATION MAIN CULPRIT

Dr. Simon Ramo
Director and Co-Founder,
TRW Inc.

How do we regain technological superiority? Hosts of negative factors, not involving science and technology, have become bottlenecks...

If broad technological inferiority should come to characterize America, living standards certainly would drop, our security would be threatened, and our economic competitiveness in world markets would collapse.

Unfortunately, America's technology position has deteriorated. It is not that we have lost the innovative touch. Instead, hosts of negative factors, not involving science and technology per se, have become dominant bottlenecks to progress.

Poor "real" earnings

The main problem is inflation, which has led to poor real earnings by technological corporations and low cash flows.

Since taxes are paid on stated (and inflated) profit figures, not real ones, many corporations have been taxed nearer to 80 percent of true earnings than the reported 40 percent, the useful cash flows often being less than dividends paid.

Not surprisingly, the limited funds now available for investment typically are put into "safe" technology changes, those representing only small increments. *Bold technology advances too often call for more risk investment than is to be expected in our inflationary economy.*

If we could halt inflation and create tax incentives for investment, most of America's technology lag would soon evaporate. New products would blossom to create more job opportunities. Improved methods would be developed to enhance productivity and lower costs—providing the base for further growth.

Another handicap to the nation's realization of the full benefits of technology advance has been the growing adversary relationship between government and business. Ours is not (and never was) a totally capitalistic, free-market society. We are a hybrid—partially a free-enterprise economy and a government-controlled one. *The secret to success is to arrange the best functions for the private sector and the government.*

One simple formula won't establish these optimum missions. The government-private split of roles and responsibilities for energy activities, for instance, needs to be different from that for the sponsoring of basic research, or for military weapon system development, or for protecting the environment, or for stimulating the computer-communications revolution.

One simple answer? No!

Most importantly, we cannot hope to arrive at the most sensible relationships by espousing either of two exaggerated views: 1) Since profit-seeking enterprise cannot act objectively in the national interest, government control is the answer. 2) Since government is a wasteful, incompetent bureaucracy, we should leave everything to the free market.

LACK OF INITIATIVE BLAMED

Robert C. Seamans, Jr.
Dean, School of Engineering,
Massachusetts Institute of
Technology

Years after the energy embargo, the U.S. is still debating the advantages of various technologies rather than mounting concerted programs...

I must assert that the U.S. is falling behind its true potential in many technical areas. Note that Japanese radios, TV's, hi-fi's, automobiles and steel, to mention a few products, are not only lower priced, but usually of higher quality.

Our annual growth in productivity has dropped from over 3 percent in the 60's to less than 1 percent in recent years.

The U.S. can still mount technical effort of the highest quality, as evidenced by the recent Voyager pictures of Saturn and its moons. But years after the energy embargo of 1973-74, the U.S. is still debating the advantages of various technologies rather than mounting concentrated programs to conserve energy and to make alternate fuels available.

Clearly, the U.S. must become less dependent on imported oil, just as the U.S. must protect its environment, improve worker safety, and provide more efficient transportation, food delivery and health care. *These objectives cannot be accomplished without the innovative use of advanced technology.*

Many factors adversely influence the U.S. capability to innovate. Investment in new technology can have long-term, favorable consequences, but corporations are judged quarterly by their short-term profits.

Capital for new plants and facilities is difficult to form at present high interest rates, but the U.S. must invest today to supply needed, high-quality and low-cost products and services tomorrow.

Most commitments must be made privately, but the risk in some cases may be so great and the scale of operations so

large, that government financing is required—as in the development of fusion reactors.

A "trained brain" shortage?

Advancement, whether privately or publicly funded, depends heavily on a steady flow of scientifically and technically qualified individuals.

The number of engineers graduating at the bachelor's level has increased in the past ten years. But the number is not sufficient to satisfy today's demand.

During the past decade the number of engineering students graduating at the doctoral level has fallen by over 25 percent, thereby jeopardizing the U.S. capability for future education and innovation. The U.S. educational system from secondary school to postgraduate study cannot satisfy U.S. technical needs without stronger support from both government and industry.

Self-proclaimed experts and sincere, but uninformed, individuals advocate a return to a simpler world.

This causes many to doubt the need for advanced technology. Certainly, technology hasn't always been used thoughtfully—for the benefit of mankind. But...the U.S. cannot provide for the future without it.

WHAT THE PUBLIC THINKS.

Reported by
Kenneth Schwartz
Vice President, Opinion
Research Corporation

To simplify the issue, call it "The technology race." Americans see their country winning in space; losing on the highway.

"With respect to technology in general, is the United States now the world leader, or have some other countries overtaken us?" That was the leading question on this issue.

Of the 1,008 people contacted in a nationwide telephone survey conducted for LTV by Opinion Research Corporation, the majority (52 percent) believe that we are the world leader in technology.

However, 36 percent think we are losing out to other countries. "No opinion" accounted for the remaining 12 percent.

Space and Steel

What about specific technology? In the area of space exploration, a resounding 68 percent felt America was first. The Soviets trailed with 22 percent. Interestingly, the poll was taken in March, one month *before* the successful space shuttle flight.

After space, we asked for an opinion on which country is the technological leader in different major industries.

A majority of Americans believe their country is the technological leader in steel production: 54 percent versus second place Japan with 19 percent. West Germany was a distant third with 3 percent.

Electronics and Automobiles

It was a different story when it came to electronic products. Here, it was virtually a tie between the U.S. and Japan: 43 percent and 39 percent, respectively. But the higher the level of education, the more likely people were to believe that Japan has a technological edge. For example, 52 percent of the respondents with "some college or more" named Japan the electronics leader—against 41 percent "voting for" the U.S.

As for automobiles...Japan was the clear winner. A majority of 56 percent of Americans polled named Japan as the technological leader. The U.S. was second with 26 percent, West Germany third with 6 percent.

Again, the higher the education, the more likely they were to name Japan as the automobile leader. In fact, among those with "some college or more" the margin was 65 percent for Japan—versus 20 percent for the U.S. Among the "less than high school" group, the tally was 44 percent favoring Japan versus 35 percent for the U.S..

WHAT LTV BELIEVES

Speaking for LTV,
Paul Thayer
Chairman of the Board and
Chief Executive Officer

If the huge lead America built in technology has eroded—let us hear the news as reveille, a call to action. Not as taps...

LTV believes that an ongoing exchange of ideas between industry, educators and government is a sign of good health. We also believe the future belongs to those who seize the initiative.

We're calling special attention to the technology issue because it is a fundamental question in our society; and because we at LTV are a technology-focused company. Our Vought Corporation is on the leading edge of space and defense technology, and we are applying advanced technology in all of our other industries—energy, steel and ocean shipping.

LTV cheered the recent success of the space shuttle because Vought technology played an important role in Columbia's safe return. We also cheered because we are Americans.

LTV shares the concerns expressed by Dr. Ramo and Dean Seamans. On a positive note, the space shuttle is a dramatic example of what can happen when America makes its commitment to excellence.

Report on Vought

LTV has made progressive moves at Vought. Not many years ago, Vought was considered to be an airplane company. Airplanes are still part of our business. But only part. Today Vought is a high-technology contractor, a company that must be categorized by its capability, not by its end product.

The point is best made with examples. The U.S. Army's Multiple Launch Rocket System is the cornerstone of a growing rocket and missile business. The U.S. Air Force Space Division's Air-Launched Anti-Satellite Weapon is another major ongoing project. Vought is involved with the U.S. Navy's Supersonic Tactical Missile Project. Work on new Boeing 757 and 767 programs is progressing. It is a long and impressive list.

Overall, Vought's sales in 1980 were up nearly $100 million to $652 million. The future is bright with a backlog of over $1.5 billion.

Other issues will be discussed

This is one of a series discussing issues critical to the LTV companies. Responsible spokespeople with distinct views —usually opposite—are heard from in each. Current public opinion is also reported.

What are your views? Let them be known. Write your elected officials. If you own stock in a technology company, write the chairman. To be put on the LTV Issues mailing list write me, Paul Thayer, P.O. Box 225003-2F, Dallas, TX 75265.

The LTV Companies

Jones & Laughlin Steel, Continental Emsco Company, Vought Corporation, Kentron International, Lykes Bros. Steamship Co., Inc.

LTV The LTV Corporation
Dallas, TX 75265

By Israel Shenker

After 340 years, Galileo may beat the Inquisition

Once condemned for his irreligious belief—that the sun, not the Earth, is the center of our system—he now nears rehabilitation

Galileo was interrogated by the Inquisition for days. Here, an old man, he appears before

The bishops of the Roman Catholic Church are hardly the sort of people who find miracles unthinkable, but the event of October 22, 1980, was enough to test anyone's faith. A synod of bishops, summoned by Pope John Paul II to deliberate on the future, found itself suddenly confronted by a ghost from the past. France's Archbishop Paul Poupard, head of the Secretariat for Non-Believers, announced that the Pope wanted a re-examination "with full objectivity" of the case of Galileo Galilei.

When, a year earlier, he joined in celebrating the centenary of Albert Einstein's birth, the Pope contrasted the honor paid Einstein with the treatment accorded Galileo, "and we cannot hide it—by the men and the organizations of the Church."

Einstein himself once described Galileo (1564-1642) as possessing "the passionate will, the intelligence, and the courage to stand up as the representative of rational thinking against the host of those who, relying on the ignorance of the people and the indolence of teachers in priest's and scholar's garb, maintain and defend their positions of authority." For suggesting that the Earth revolved around the sun—a view that the church held contrary to Scripture—Galileo was condemned by the Inquisition. Broken in health, he lived another nine years, under house arrest, his work proscribed, but his convictions unshaken.

At the start, all nature had seemed to smile at him, all talents ready to his command. He played the lute, painted, wrote poetry and displayed a consummate mastery of polemics and satire. Born in Pisa in the year of Shakespeare's birth and Michelangelo's death (1564), he grew up in a Europe embroiled in religious contest, political upheaval and war. Italy was a congeries of states remote from unity, with Spain holding dominion over the kingdoms of Sicily and Naples and the duchy of Milan, the Medicis ruling Florence, and the Venetian republic contesting papal authority.

At the age of 19, Galileo is supposed to have entered Pisa's cathedral as the great bronze sanctuary lamp, newly filled with oil, was swinging to a halt; consulting his pulse he found that the swings—long or short—were of equal duration, and thus he discovered the isochronism of the pendulum. Tradition holds that he later climbed the 294 steps of the Leaning Tower of Pisa, dropped a cannonball and a bullet, and discovered that they hit the ground at about the same moment, indicating that falling bodies accelerated at the

priestly examiners at the Vatican; French Painter Robert Fleury reconstructed the scene in 1847.

same rate, independent of their weight. He certainly constructed an air thermometer, developed a geometric and military compass, and demonstrated that the flight of a projectile was parabolic.

In 1592 he was appointed professor of mathematics —a discipline that then included astronomy and geometry—at the University of Padua, where he stayed 18 years, for more than half of that time living with a mistress who gave him two daughters and a son. Meanwhile he assumed the burden of caring for a widowed mother and of providing dowries for his sisters, supplementing a small university income by tutoring, and coming to doubt that science was only what Aristotle had written.

The second-century astronomy of Ptolemy held that the sun moved daily about the Earth, but in 1543 the work of Nicolaus Copernicus, a Polish astronomer, had been published, setting forth the mathematical hypothesis that the sun was at the center of the universe and that the other heavenly bodies revolved around it. Galileo began to agree, and on hearing of a marvelous new instrument that magnified the heavens he improved the telescope and found support for Copernicanism and fresh occasion for wonder: the moon was not a smooth and polished sphere but was studded with "vast protuberances, deep chasms and sinuosities"; the Milky Way was disparate stars; Venus had phases; four moons orbited Jupiter, creating a universe in miniature.

Poets penned odes to the newly manifest panoply of the spheres, but philosophers at Padua in Italy looked the other way. "My dear Kepler," Galileo wrote to the great German astronomer, "What would you say of the learned here, who, afflicted with the stubbornness of the ass, steadfastly have refused to cast a glance through the telescope? What shall we make of all this? Shall we laugh, or shall we cry?"

To give himself more time to bolster his case and to pursue his research, Galileo abandoned teaching and won appointment in Florence as the Grand Duke of Tuscany's chief philosopher and mathematician. Finally, in *Letters on the Sun Spots* (1613), he mentioned his growing interest in Copernicus.

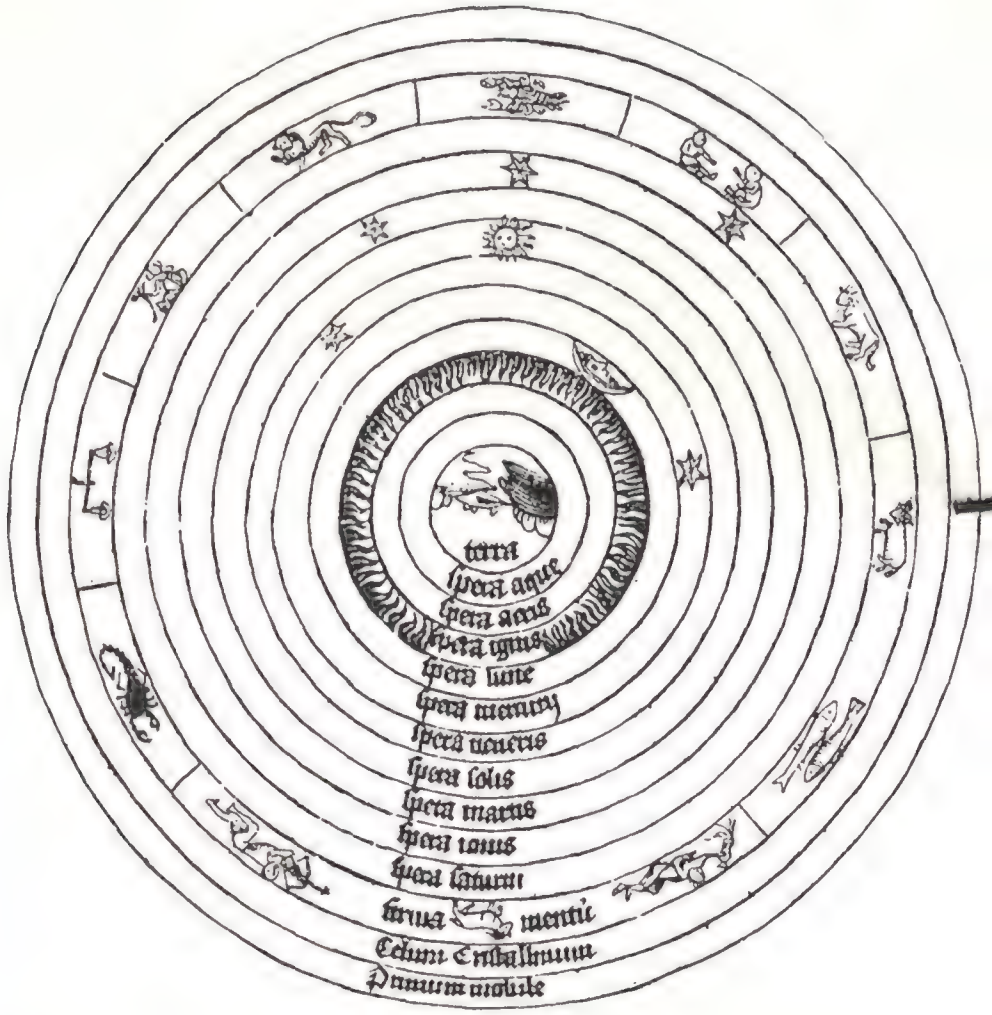
When Scripture was invoked against him, Galileo wrote his disciple Benedetto Castelli that the Bible, though certainly true, conveyed truth figuratively as well as literally, as when it spoke of the hand of God or the tent of heaven. Believing that "the Bible shows the way to go to heaven, not the way the heavens go," he argued for discovering scientific fact, *then* for interpreting Scripture according to these observations. In all propositions not clearly a matter of faith, he seemed to feel, the Pope doubtless could lay down the law, but no one could alter the facts.

Churchmen raised the alarm. Nicolò Lorini, a Dominican professor of ecclesiastical history, who had earlier inveighed against Galileo's claims, forwarded to the Holy Office a copy of Galileo's letter to Castelli. Tomasso Caccini, a Dominion friar, preached that mathematics was the province of the devil, and that the notion of a moving Earth bordered on heresy. Caccini testified against Galileo to the Holy Office, and warned that Florence was alive with Galileist speculation.

When Paolo Foscarini, a Carmelite friar, sent Cardinal Roberto Bellarmine, foremost theologian of the Church, a treatise proposing the Scriptures need not be contrary to heliocentrism, the cardinal objected that Copernicanism could be proposed only as a hy-

The author, who lives in Scotland, has written frequently for SMITHSONIAN. *In the May issue he wrote about the eccentric Lord Monboddo.*

Two of Galileo's telescopes are displayed in Florence with an ivory-mounted "objective lens."



As shown in the *Nuremberg Chronicle*, Ptolemaic universe has Earth at its center.

pothesis, not treated as fact until it had been demonstrated; it was contrary to current understanding of Scripture. Had not Solomon written: "The Earth abideth for ever; the Sun also riseth, and the Sun goes down, and hasteth to his place whence he arose?" Had not Solomon received his wisdom from God?

In December 1615, alarmed by reports of the Inquisition's interest, Galileo went to Rome and protested that he had never wanted to get involved with Scripture, but only to demonstrate truth, and this would be impossible if his lips were sealed and if people were incapable of hearing his arguments. "He is all afire with his opinions," the Tuscan ambassador reported, "and he puts great passion into them, and not enough strength and prudence in controlling them; so that the Roman climate is getting very dangerous for him . . . for the present Pope [Paul V], who abhors the liberal arts, cannot stand these novelties and subtleties; and everyone here tries to adjust his mind and his nature to that of the ruler."

By February 1616, theologians of the Holy Office had decided it was not only "foolish and philosophically absurd" but also heretical and contrary to Scripture to hold that the sun was stationary, the Earth moving. The Congregation of the Index, which com-

1 Stellarū fixarū sphæra īmobilis
2 Saturnus xxx anno revolvitur
3 Jovis xij ānorū revolutio
4 Martis bima revolutio
5 Tellurus cū Luna ānua
6 Veneris nonimestris
7 Mercurius xxc dierū
Sol

The Copernican universe has the sun at its center—which got Galileo into trouble.

piled the Vatican's list of forbidden books, ordered the suppression, until it could be corrected, of Copernicus' treatise on the revolutions of the heavenly bodies, and it condemned Foscarini's work. Pope Paul instructed Cardinal Bellarmine to admonish Galileo to abandon heliocentrism as reality; if Galileo refused, he was to be commanded to abstain from teaching, defending or discussing his views; if still recalcitrant, he was to be imprisoned.

The cardinal reported that Galileo submitted readily to the admonition. At Galileo's request, the cardinal gave him a statement declaring that he had not been summoned to Rome or been forced to abjure his convictions or been punished in any way, but simply been notified of the papal declaration that it was contrary to Scripture to hold or defend the notion that the Earth moved around a stationary sun.

Though the accession in 1623 of Pope Urban VIII seemed to augur well for learning, the new Pope soon showed less concern for science than vanity, ambition, military power and narrow orthodoxy. To Galileo's support for heliocentrism, Urban apparently replied with arguments about the nature of God. Perhaps you can demonstrate heliocentrism by observation, Urban suggested, but God is omnipotent and it may please Him to have arranged the universe so that it seems to follow your laws when it really follows His.

But, having fixed limits for the ambitions of science, the Pope seems to have urged Galileo to continue working, and finally, in 1629, Galileo completed his *Dialogue on the Two Chief World Systems*, an extended Socratic discourse arguing the case for Copernicus. When Galileo sought permission to publish, the Master of the Sacred Palace, the Vatican censor, temporized, invented obstacles, posed conditions, mandated revisions. Galileo declared himself more than ready to qualify his theories as "dreams, nullities, paralogisms and chimera," if only the work could be published. "The months and the years pass," he complained, "my life wastes away, and my work is condemned to rot."

Finally the text was delivered to the Florentine Inquisitor for a second opinion, while preface and conclusion remained in Rome to be revised in accordance with the wishes of the Pope. In 1632, with a new preface suggesting that the book was a poetical conceit, the *Dialogue* was published.

Warning of dangers to the purity of the faith and to

Aristotle, Ptolemy and Copernicus stand on title page of 1635 edition of Galileo's major work.

Upset by Galileo's advocacy of heliocentrism, Pope Paul V (shown in a mosaic portrait) in 1616

had his theologian, Cardinal Bellarmine (above), admonish Galileo to abandon the idea.

the tranquility of the faithful, the Pope went over to the attack. The Master of the Sacred Palace realized that the preface had fooled no one and that the *Dialogue* was obviously a powerful argument for Copernicanism as reality, not poetry. The Inquisitor of Florence was directed to call at the printer's to order suspension of publication and to collect all copies of the book, but the edition had sold out. Seeking to exonerate himself, the Master of the Sacred Palace accused the Pope's secretary of having given false assurances about Galileo's fidelity to papal views, and the secretary was sent into exile. But the Pope's anger was unappeased, and hardly softened by the suggestion that in the *Dialogue* Galileo had put the Pontiff's views in the mouth of Simplicio, a simpleminded character. On October 1, 1632, Galileo received a summons to appear in Rome within 30 days.

He appealed to Cardinal Francesco Barberini, the Pope's nephew, that a trip in winter would further endanger his fragile health, and noted: "I curse the time devoted to these studies. . . . I repent having given the world a portion of my writings; I feel like consigning what is left to the flames and thus placating at last the relentless hatred of my enemies." But if neither age nor frailty nor grief nor rigors of travel pleaded forcefully enough, "I will undertake the journey, esteeming obedience more than life."

The Pope noted that the business had been settled in the last Congregation. No further reply was needed. He need only inquire of the Assessor whether orders had been carried out.

Tuscany's ambassador pleaded with the Pope not to force Galileo to come to Rome: "Your Holiness incurs the danger of his being tried neither in Rome nor Florence, for I am assured that he may die on the way."

But the Pope was in no mood for benevolence. He must come, the Pope insisted. He could come by very easy stages, in a litter, with every comfort, but he really must appear in person.

To a second summons, Galileo responded with a certificate signed by three physicians: "His pulse intermits every three or four beats . . . frequent attacks of

giddiness, hypochondriacal melancholy, weakness of the stomach, insomnia, sudden pains about the body . . . a serious hernia with rupture of the peritoneum. All these symptoms deserve notice, for with the least aggravation they could endanger life."

The Inquisition would not relent. If Galileo did not come of his own volition, he would be brought to Rome as a prisoner in irons. The Grand Duke offered his litter to ease the journey, and instructed his Rome embassy to receive Galileo as a guest.

On April 12, 1633, Galileo surrendered to the Holy Office and was brought before his judges. A papal commission had concluded that Galileo had gone against the 1616 injunction not to teach in any way the views of Copernicus.

He tried to make his judges' decision easier

Galileo put on record a statement declaring that he had no recollection from 1616 of the phrases "not to teach it" and "in any way whatsoever." (Indeed, there is some doubt about what Galileo was told, and about the authenticity of the record offered as the minute of the meeting in 1616.) So he had not set out deliberately to violate orders. He asked his judges to have mercy on his "pitiable state of bodily indisposition, to which, at the age of seventy, I have been reduced by ten months of constant mental anxiety and the fatigue of a long and arduous journey at the most inclement season—together with the loss of the greater part of the years which . . . I had reason to expect."

The question then was, did he himself hold the idea that the sun was stationary, the Earth moving? As the days dragged on, the cardinals debated the fate of their prisoner. On April 27, the Commissary General of the Inquisition visited Galileo and urged him to confess and spare the judges a difficult decision.

On April 30 he appeared once more before the tribunal and declared that he had now reread the *Dialogue*, and realized that he had not taken sufficient care, that he had allowed too much weight to evidence supporting Copernicus. Given a chance to do it over, he would weaken the arguments that appeared to give persuasive grounds for holding views the Church condemned. The tribunal allowed him then to leave the Holy Office and return to the Tuscan embassy. "It is a fearful thing to have to do with the Inquisition," the ambassador wrote the Grand Duke. "The poor man has come back more dead than alive."

The Pope decreed that Galileo was to be interrogated further, even with the threat of torture; to abjure vehement suspicion of heresy in a plenary assembly of the Congregation of the Holy Office; condemned to imprisonment at the pleasure of the Holy Congregation; and was never to discuss Copernicanism. The

Pope Urban VIII (above) summoned the aging Galileo to Rome and the Inquisition in 1632.

Palazzo Firenze, where Galileo stayed in 1633, later was seat of Florentine embassy.

Dialogue was to be prohibited, and Galileo's sentence disseminated.

On June 21 Galileo was back before the Inquisition to declare: "I do not hold and have not held this opinion of Copernicus since the command was given me that I must abandon it." Once again he was ordered to tell the truth or face torture. "I am here to submit," Galileo responded, "and I have not held this opinion since the decision was pronounced. . . ."

The next morning he was brought to the Dominicans' Church of Santa Maria sopra Minerva, built over the ruins of an ancient temple to the Roman goddess of wisdom. In the white shirt of a penitent, kneeling before his judges, Galileo heard the verdict declaring him "vehemently suspected of heresy"; he would be absolved "provided that, first, with sincere heart and unfeigned faith, you abjure, curse, and detest before us the aforesaid errors and heresies. . . ."

He was condemned to prison, and required to "repeat once a week the seven penitential psalms."

Galileo read out the text of abjuration, and he swore never to give occasion for future suspicion, promising to denounce anyone he suspected of heresy. Officially, the Earth had been stopped in its tracks. (Years later the legend spread that when Galileo rose from his knees he exclaimed "Nevertheless it moves!" This gloss is absent from all contemporary records, and such an outburst would have constituted reason for the judges to dismiss all thought of leniency.)

Galileo was then released to the custody of the Tuscan embassy, and subsequently was permitted to live on his farm near Florence. There, ailing and blind, he continued to ponder the laws of nature and the ways of Man, reserving utter scorn for his judges and their "hatred, impiety, fraud and deceit."

Though maintaining afterward that he had nothing to do with its publication, Galileo arranged for his final masterpiece, *Two New Sciences,* a report on decades of experiments and discoveries, to be printed in Holland, where it escaped control of the Inquisition.

After Galileo's death, in 1642, the Pope refused the Grand Duke permission for a monument over the grave. (The refusal was revoked later and there is now a monument.) In 1757 the Church at last declared it licit to speak of heliocentrism, and in the following century the Vatican revised the Index accordingly.

This was not good enough for many of the bishops gathered at the Vatican Council in 1964, which happened to be the 400th anniversary of Galileo's birth. The bishop of Meissen, Germany, urged the Church to accept the truths of science and to admit its mistake in condemning Galileo. To sustained applause from his fellow prelates, Belgium's Leo Josef Cardinal Suenens pleaded for the church not to oppose modern science, adding: "I beg of you, my brother bishops, let us avoid a new 'Galileo affair.' One is enough for the Church." The bishop of Strasbourg, France, suggested that many believed the church was fearful and on the defensive about modern life; the church could demonstrate its good intentions and dissipate misgivings by rehabilitating Galileo, and it would have to be done by the supreme ecclesiastical authority.

The pleas found no echo in the supreme authority until John Paul II asked for the case to be re-examined. Slowed down by the assassination attempt against the Pope, Galileo's rehabilitation may not come until next year, if then. But the Vatican machinery, which often grinds slowly, is at least and at last in motion.

This modern-day observatory at Arcetri, a small village near Florence, is a monument to Galileo. Galileo's home, within sight of the observatory, may become world center for study of astronomy.

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By James Idema

Where mountains and Western skies make opera magic

For 25 years the operatic art has enriched Santa Fe's high-country summers, attracting music lovers from all across the country

Ashley Putnam, onetime apprentice in Santa Fe company, now a star, makes up for role in *La Traviata*.

On an unseasonably warm June evening, after the sun had set directly behind the stage of the Santa Fe Opera House, daylight lingered late over New Mexico's high desert plain. The sky had gone from deep blue to violet to mauve, and the Jemez range floated darkly on the horizon. A lively capacity crowd had been sipping pink champagne and admiring the beds of white petunias in the opera patio before being summoned to their seats. From inside the open-air theater they could still see the mountains' dramatic, soaring shapes against the pale light.

It was opening night of the opera's 1980 season. After the somber prelude to *La Traviata*, which began shortly after 9 o'clock, the audience needed to be transported to the Paris salon where Violetta is entertaining her friends. As the stage lights went up on the glittering scene, the mundane distractions of a summer twilight quickly vanished and the preposterous magic that is opera once again had its way. By the time Violetta was exhorting her guests to enjoy life as madly as possible while it lasted, some 1,800 others were eager to join her party.

Opening of the season at the Santa Fe Opera, today one of the most renowned houses in the country, is a determinedly local event. It occurs before tourists invade this prime vacation area in full force and before opera devotees—including critics—from all over the United States and many European countries trek to New Mexico's ancient capital to discover what sort of fare this distinguished company is currently offering. During the season, which lasts two months and features 34 performances, more than 50 percent of the audience comes from out of state. Many of the performances are sellouts, with a total audience exceeding 66,000. This year, the 25th-anniversary season opened July 3 with Puccini's *La Bohème*. Also being performed are Rossini's *Il Barbiere di Siviglia*, Richard Strauss' *Daphne*, Stravinsky's *The Rake's Progress* and Hindemith's *News of the Day*.

As with most seasons, the fare is a mix of Romantic and contemporary repertory. Opera goers are as sophisticated here as anywhere else in the world, and a season restricted to old favorites would not go down with them at all well. And they are vigorously responsive. During the performance of an experimental piece, impudently titled *Opera*, by Luciano Berio in the 1970 season, a woman stood at her seat and howled in protest before three ushers dragged her to an exit. (The critics were hardly more respectful.)

After the performance in 1976 of Virgil Thomson's

One of the country's best and most complete opera plants backs up the productions in a dramatic setting.

Photographs by David Stein

Apprentice tenor Lawrence Paxton puts finishing touches to makeup for appearance in *Eugene Onegin*.

The Mother of Us All, a young woman stripped to her waist and perched on the ledge of a fountain at the entrance, admonishing the departing audience not to believe the opera's message. "Women are still not free!" she cried. Her performance was received as good-naturedly as was Thomson's amiable piece about Susan B. Anthony's fictitious confrontations with the likes of Daniel Webster and Lillian Russell.

However, for all the company's admired venturesomeness, its 1981 *La Bohème,* sung in Italian, is a revival of the successful 1973 production. *Traviata* was surefire last season, especially with young soprano Ashley Putnam as the tragic courtesan. A recent alumna of the Santa Fe Opera's apprentice program, she was called by one critic "THE Lucy of our times" for her *Lucia di Lammermoor* here the previous year. She has sung leading roles with the New York City Opera and the operas of San Diego and Washington. She made her Glyndebourne debut in 1978 as Musetta in *La Bohème.* The Santa Fe Opera's newest star has striking beauty, commanding stage presence and natural ability as an actress. Her aria, "*Ah! fors' è lui,*" near the end of the first act of *Traviata,* had the opening nighters comparing her with famous Violettas of the past. As they lingered in the patio after the performance for refreshments and dancing under a full moon, they were still talking with a kind of hometown pride about Ashley Putnam.

One part-time Santa Fean who could have taken special pride in Putnam's performance, as well as in the entire production, was *Traviata*'s conductor, who happens also to be the founder, general director and veritable sine qua non of the Santa Fe Opera. During each season John Crosby shares conducting assignments with distinguished guests. This season he conducts *Daphne* as well as *La Bohème.* Although he is best known for his comprehensive knowledge of opera production and for his proprietary obsession with perfection at Santa Fe, his first love is conducting. Trained also as a violinist and pianist, he came to opera by way of the pit, having studied in the East with Rudolph Thomas, Leopold Sachse and Pierre Monteux before heading west in 1956 to found an opera company.

But Crosby's familiarity with production details and his affinity for personal participation in them is what is legendary in Santa Fe. "His knowledge is simply remarkable," says Thomas B. Catron III, president of the opera association's board of directors. Catron is a Santa Fe attorney who headed a blue-ribbon citizens' group that helped bring Crosby's concepts to local fruition a quarter-century ago. "He knows everything—the music and the artistic side, of course, but he's an expert mechanic and electrician, a carpenter, plumber, gardener and accountant. He knows the salary of every one of the 400 people on our staff and how many gallons of water our wells are pumping at any given time."

Crosby, a handsome, serious, soft-spoken, 55-year-old, is realistic about his reputation for omniscience. The uniqueness of the Santa Fe Opera, its comparatively remote situation in particular, requires management skills quite different from those needed by other impresarios. Mention of the water supply led him in a recent interview to talk about this uniqueness.

"A law was passed in New Mexico a year ago con-

The author, a former Washington writer and editor who has a special interest in music and opera, now lives and writes in Chicago.

Soprano Ellen Shade, *Magic Flute's* Pamina, talks with 1980 artistic administrator James L. Dickson.

cerning water and public health, and now every 90 days one of our maintenance people must draw off in a certain container a certain amount of water and deliver it to a laboratory in Santa Fe which tests it for purity and submits the results to the New Mexico Environmental Protection Agency, which then sends us a postcard a couple of weeks later that says, yeah, we can continue drinking our water. You don't have to do that at the New York State Theater."

He emphasized other critical functions for which most opera companies are not responsible.

"The Washington Opera is not involved in hiring the people who maintain and paint Kennedy Center," he said. "Kennedy Center does that and charges rent. The Baltimore Opera rents the Lyric Theatre from the foundation that owns the building. And many opera companies don't even handle their own ticket sales; the rental figure incorporates the costs of the box office."

Off-season the opera staff shrinks to around 20; the maintenance people remain in Santa Fe and an administrative group moves into Crosby's five-story town house in New York. Crosby spends most of the year there, dividing his time when he's not traveling between opera business and his duties as president of the Manhattan School of Music.

John Crosby is a native New Yorker, the son of an influential lawyer and gifted mother. His mother taught him violin and piano along with reading. While a prep school student in Connecticut, he was advised, because of chronic asthma, to spend a year at a school in Los Alamos. He fell in love with the countryside. But after the school year, it was a long time before he returned. He was drafted in 1944, served as a corporal with the First U.S. Infantry Division in Europe and later played double bass, trombone, violin, piano and accordion in the 18th Regimental Band. After the war he took his B.A. in music at Yale and from 1951 to 1955 attended conducting classes at Columbia, where his serious interest in opera began. He worked as an assistant director and as an accompanist and singing coach, and, on every possible night, he was a standee at the Metropolitan Opera. His father, who died in 1979, put up $200,000 to get his son's dream project started. Crosby bought a ranch just north of Santa Fe and in 1956-57 built an opera house that seated 480. There was a good deal of local resistance at the outset, and raising funds to cover critical operating expenses was a painful, sometimes humiliating task. An opera house in the desert! Who needed it? But on July 3, 1957, it opened on schedule with *Madama Butterfly*. Eleanor Scott, in her excellent *The First Twenty Years of the Santa Fe Opera,* described that event:

"Opening night found Crosby wrestling the theater's recalcitrant plumbing with barely time to exchange monkey wrench for baton. When he stepped onto the podium to summon the first notes . . . the house was sold out. The weather, perfect. There are many who still remember the chorus softly singing as it climbed the moonlit hill and wound its way through piñon to reach the stage, the lights of Los Alamos trembling far on the horizon. It was a moment of magic."

The critics seemed stunned by the absence of amateurism in the Santa Fe Opera's auspicious debut. The

Backdrop for opera ranch pool, reserved for the staff and company, is Sangre de Cristo mountain range.

Bass-baritone William Dooley, as a commanding Archangel Gabriel, towers atop stairs in Schoenberg's one-act opera, *Die Jakobsleiter*. Production was part of a Schoenberg evening of three one-act operas.

general director, who was to become famous for his insistence on the absolute best, had put his stamp on this festival at the very start. The first six performances sold out. By the end of the season, with a repertory that also included *The Barber of Seville, Così fan tutte,* Richard Strauss' *Ariadne auf Naxos,* Stravinsky's *Rake's Progress,* Pergolesi's *La Serva padrona* and a world premiere, *The Tower* by Marvin David Levy, Santa Fe had joined the ranks of important opera festivals.

Crosby from the outset has been convinced that a new opera company like Santa Fe must be a taste-stretcher, although he is wary of experimental works by young, untried composers. Santa Fe has already produced four world premieres and 19 American premieres in its comparatively brief history. Another world premiere is in the future repertory.

"We have an obligation to contemporary music," he said, "and if we don't pay our dues and produce contemporary music we're going to contribute to a shutdown of the art form. I would say that Santa Fe's obligation lies more precisely in the realm of well-rehearsed, well-produced performances of either American premieres of works that have had their first hearings in Europe or world premieres, but always of works by composers where there is reason to believe that something very worthwhile will materialize."

The early skepticism is understandable. On the other hand, Santa Fe is not by any stretch of the imagination a raw, frontier town. Long before Crosby ventured there as an Eastern schoolboy, it had been a place that was hospitable to painters and poets and to eccentrics of many stripes. Figures like D. H. Lawrence, the poet Witter Bynner and painters such as John Sloan, John Marin and Georgia O'Keeffe are all linked with the town or its environs. Mrs. Walter B. Mayer, who has been associated closely with the opera since its inception and is a former president of the board, likened Santa Fe to a seaport.

"A tolerant, cosmopolitan, informal kind of place," she said. "In the old days it was a place where you came to kick up your heels and nobody cared. There's still some of that. All sorts of people ended up here: soldiers, trappers, hunters, writers, artists and people looking for treasure. Good guys and bad guys. It still is a fine place to end up."

As for the opera house itself, the setting is stunning. From almost any vantage a stranger to the high pla-

teau of northern New Mexico is impressed initially by the radiant transparency of its atmosphere. Somehow, at 7,000 feet elevation, the credibility of everything he looks at is challenged, especially if he comes from a crowded smog-plagued city near sea level. Between him and a horizon that undulates in the brilliant sunshine, the mesa rolls out like a carpet of astonishing design and color, accented by tufts of juniper and piñon and folds of rock.

Santa Fe itself has a long and romantic history; its Spanish founders named it La Villa Real de la Santa Fe de San Francisco de Asis more than three and a half centuries ago. It's a small town of fewer than 50,000, but its clear, dry air, inspiring vistas and informal social ambience have in recent years attracted many urban refugees, including a number of affluent professionals. Typically, Crosby's analysis of its potential was comprehensive and incisive.

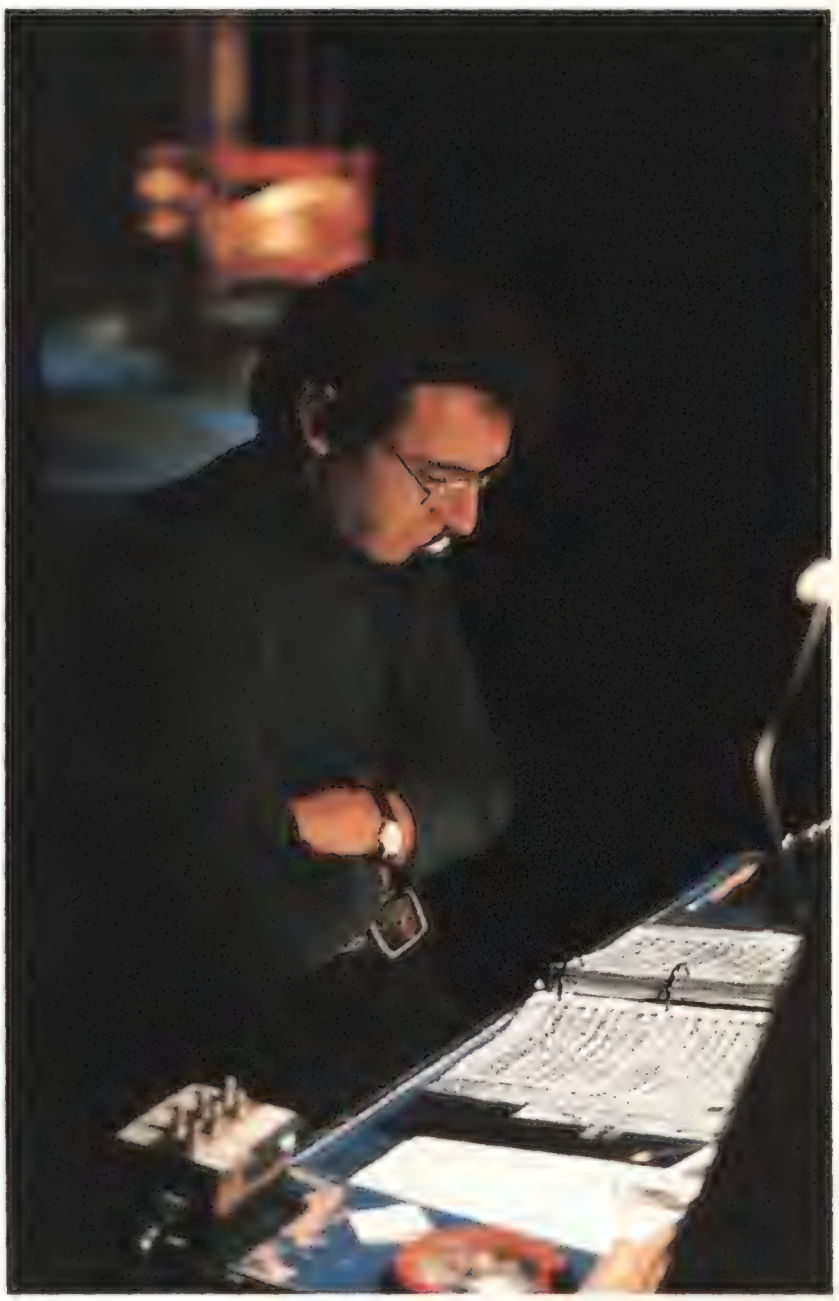
Crosby reasoned that many talented young singers in America were unemployed in summer and that they could be persuaded to come to this beautiful part of the country and sing for modest salaries. The principals would be men and women with established operatic careers who could be supported by apprentice singers as chorus and understudies. A pioneer spirit pervaded the enterprise, helping to launch a dramatic success story that has everything—even a trial by fire.

Rising from the ashes

Following the American premiere of Paul Hindemith's *Cardillac*, during the early morning hours of July 27, 1967, the original opera house burned to the ground. The season was salvaged, however, by an all-out "up-with-opera" effort by the company and the community, with critical help from other performing arts groups across the country. Thirty-six hours after the fire, the 1967 season continued on a hastily erected stage in the Santa Fe High School's Sweeney gymnasium with *The Barber of Seville*. The costumes for *Barber* had survived the fire only because they were at the cleaners. The season continued to its conclusion in the gymnasium with 15 more performances.

Perhaps even more extraordinary than the rescue of the season was the success of the rebuilding program, planning for which began before the ashes got cold. The same team of local architects, McHugh and Kidder, and acoustical consultants, Bolt, Beranek and Newman of Los Angeles, that had designed the original theater was engaged, and construction went forward during one of the severest winters in several years. But the 1968 season opened on schedule, with a moving revival of *Madama Butterfly*, in a spectacular new opera house of cinder block, reinforced concrete

Founder of Santa Fe Opera, John Crosby, leads an open-air rehearsal. He is also its general director.



Central control console puts stage manager Dean Gordon in touch with all technical personnel.

and steel that had been erected on the site of the first one. Its sweeping lines give it an aeronautical look—a great desert bird poised for flight—but its adobe-colored walls are reassuringly terrestrial.

The opera's annual operation is currently budgeted at $2 million. Approximately $1.2 million of that is obtained in earned income—$1 million in ticket sales, plus advertising in the program book, receipts from the bars, sales of posters and rental of costumes to other companies. Most of the rest—31 percent—comes from individual gifts and from money raised by activities of the New Mexico Opera Guild, an organization of resourceful and energetic women with chapters in ten New Mexico communities and in El Paso. Foundation and government grants and gifts from businesses bring in 12 percent. Contributors listed in the 1980 program came from 49 states in addition to New Mexico, and nine foreign countries.

The opera house seats 1,765. A standing-room section accommodates 150 additional patrons. It is only 90 feet from the orchestra pit, which ensures an unusual sense of intimacy in a theater of this size. The pit is mounted on an elevator and holds 80 musicians. There is no curtain, and no scenery is flown, as in conventional opera houses. Sets are mounted on casters and wagons, and scene changes are accomplished deftly on a darkened stage or occasionally by supernumeraries during the action. Sliding doors at the rear of the stage may be opened in a variety of combinations to the night sky. In *Madama Butterfly*, the dependable lights of Los Alamos become the lights of Nagasaki's harbor.

A backstage tour reveals one of the most complete opera plants in the country. It includes a carpenter shop, where set construction for the next season starts in October; welding and paint shops; a costume shop where 35 drapers, stitchers, milliners, painters and others produce 100 new garments every season, and a prop shop, where one can spot such necessities as the corpse for Offenbach's *La Grande Duchesse de Gérolstein,* the samovar for *Eugene Onegin, Lulu's* garret and not only the Queen of the Night's bat for *The Magic Flute* but Tamino's flute itself.

The administrative staff and the artists, who comprise the rest of the company, are headquartered close by in a shaded complex of offices, library, rehearsal halls, canteen, ranch houses and swimming pool, from which on any given summer's day one hears a pleasant mix of rustling poplars, practice trills and laughter. Crosby's summer residence is here. Other members of the company rent accommodations in town. The artists this season include 46 apprentice singers, all but five of whom are new to Santa Fe. In addition to performing in the chorus, apprentices take small roles and understudy the major ones. The apprentice program, which was incorporated into the original organization in 1957, has a winning track record. Some 95 percent of its participants have continued with careers of some kind in music and at least ten percent are enjoying major operatic careers. Seven former apprentices are appearing in major roles during Santa Fe's 1981 season. Among those whom the program has graduated into the first ranks are Ashley Putnam, Brent Ellis (he sang Germont in *Traviata*), Sherrill Milnes, Judith Blegen and Michael Devlin, all of whom have sung with the top companies, and Ellen Shade, who sang the role of Pamina in *The Magic Flute* the last two seasons in Santa Fe.

All the way to the Met

Ellen Shade made her Metropolitan Opera debut as Eva in *Die Meistersinger,* which she also sang with the Frankfurt Opera, and she has sung with La Scala, the Chicago Lyric Opera and the Cincinnati and San Francisco operas. By the acknowledgements of many who have heard her, this young New Yorker is poised for international stardom. She gives generous credit to the Santa Fe apprentice program. "It was the beginning of everything," she said, "and what I learned by listening and watching was priceless."

She is also grateful for the "good ears" of John Crosby and his associates who annually audition some 700 singers, most in their mid-20s, in New York, Boston, Houston, Chicago, Los Angeles and in the major conservatories and university music schools elsewhere, before selecting their 40-odd apprentices. One finalist last year was Lawrence Paxton of Columbus, Ohio, who is a graduate tutorial student and voice instructor at Indiana University in Bloomington. He did not realize he had a singing voice, he said, until a fellow roisterer at a fraternity party during his undergradu-

ate days at Ohio Wesleyan insisted that Paxton's beery tenor had Caruso qualities. "I thought I'd better check that out," he said.

For singing in the chorus, waltzing in *Onegin*, appearing as First Armoured Man in the *The Magic Flute* and understudying the role of Tamino in *Flute*, Paxton last season was paid $110 a week, about half of which went for board and room. (Crosby said he intends soon to recommend to his board that it consider building summer lodging for the apprentices on property near the opera house.) A typical day for Paxton began with a movement rehearsal from 9 to 10 A.M., then a staging rehearsal until noon. At 2 he was called to a rehearsal of the chorus that lasted until 5.

Paxton, a slim, darkly handsome young man, was somewhat surprised to be here, enormously stimulated by the experience and eager to get on with his career. That he found his busy schedule exhilarating rather than exhausting seems to speak well for him, for the apprentice program and for the future of the Santa Fe Opera.

"It's all quite basic," he explained. "You have to want to sing to be here. You have to want that very, very much. This is a prestigious place to be, and the opportunity you have when you're selected is not to be wasted."

Metropolitan Opera Company mezzo Rosalind Elias as Klytemnestra in last year's production of Strauss' *Elektra*; this year she was Baba in Stravinsky's *Rake's Progress*. Strauss is a favorite of Crosby's.

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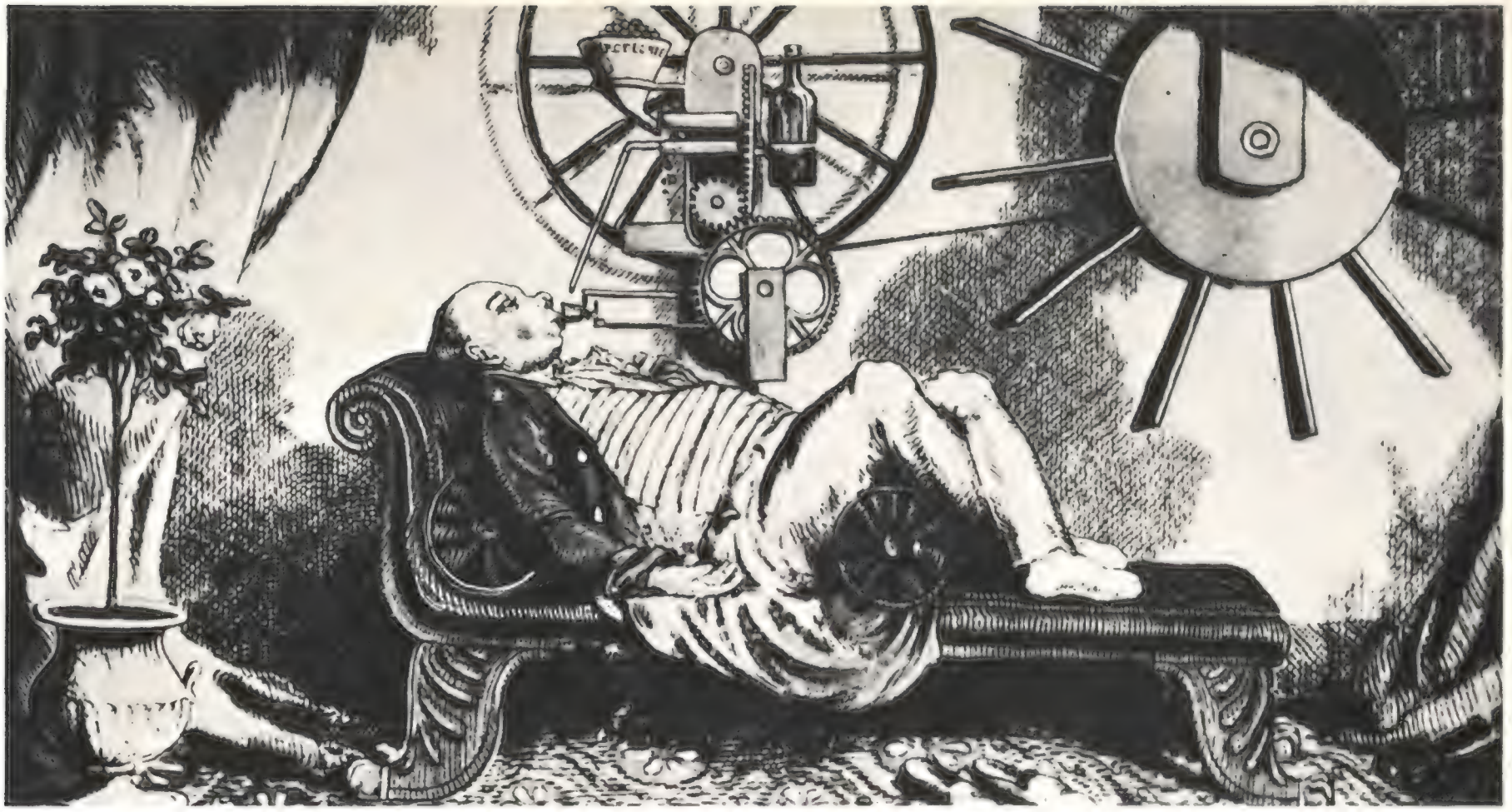

Summer's ease, as depicted in a 19th-century British caricature, is produced by a mechanical contraption that fans the body, cracks nuts and serves wine too.

Trying to stay cool, once again, is a mechanical breeze

Electric fans, the 'latest' way to beat both the heat and the high cost of energy, had ingenious precursors

By Benjamin W. Lawless

A generation ago, it was a mark of progress to get rid of one's old electric fans and settle into the pleasures of air conditioning. But as the energy crunch sent electric rates soaring during the 1970s, total sales of electric fans in this country also soared again, to 12 million per year. Even old-fashioned ceiling fans are back, with five times more being sold now than three years ago. Which only proves that, in keeping cool, there is nothing new under the sun.

Although personal cooling devices have been around ever since some overheated anthropoid discovered that waving a palm leaf in front of his face produced the agreeable sensation of a refreshing breeze, there seems to have been a burst of creativity beginning in the 18th century, as inventors grappled with the problem of designing mechanically powered, personal wind-generating machines.

An early and successful use of mechanical fans was developed in the steamy factories of the Industrial Revolution. Workers sweating at their tasks got the idea of attaching wooden or metal blades to the whirling line shafts overhead that were used to drive the machinery. The resulting breeze was evidently so satisfying that within a few years most factories on a hot summer day were in danger of having their roofs fly away as long lines of line-shaft fans howled over the workers' heads.

Thomas Jefferson, a toiler more at home in the vineyards than the sweatshops, nevertheless cared enough about the comfort of his dinner guests during the sweltering summers in Virginia to take a crack at designing a mechanical fan that would propel the air above his table at Monticello. As in almost everything he did, Jefferson recorded his thoughts about mechanical fans in a notebook, including a full analysis of the operation of the device.

He begins with a description of the area above his dining room table, where "a pendulum is to be fixed, with its claws to catch into what is called the swing wheel of a clock, or rather a barrel wheel with the teeth of a swing wheel. A cord round the barrel of the swing wheel, carried to a pulley over the well of the stairs and having a heavy weight, will put the swing wheel into motion. The teeth of that laying hold of the claws of the pendulum will keep that in vibration, and consequently the fan wing which is tenanted into its axis exactly under

The author, in charge of exhibitions at the National Museum of American History, wrote about airplane seats in the September 1979 SMITHSONIAN.

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the skylight, and of the breadth of the funnel mouth of the skylight."

Having got his fan properly positioned, Jefferson the physicist begins to speculate on how to make it go faster or slower.

"The vibrations may be retarded or accelerated 1. by the great weight 2. by the bob of the pendulum, 3. by the length of the pendulum rod, 4. by the size of the fan. With so many regulating powers it will be easy to make the vibrations that shall be found best."

But it was Jefferson the perfectionist who improved on his own fan design as a final thought. He proposed a way to make the fan turn faster, although at the ultimate cost of more elbow grease.

"Suppose besides the swing wheel, it should have pinions taking in the

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Treadle-operated fan used foot power to produce a zephyr, leaving hands free.

teeth of a barrel wheel making one revolution for two, three or four of the swing wheel. Consequences: the weight must be proportionally increased, and consequently the exertion in winding up."

Jefferson's dining room fan, if it was ever built (and there is no physical evidence at Monticello that it ever was), probably would have been used much like his famous hall clock, whose cannonball-like weights marked the days of the week. Imagine the anxiety of a guest who, looking at the inexorable drop of the weight down the stairwell, realizes to his horror that he is still working on the meat course when the heavy ball is registering dessert.

One might speculate that the obvious difficulty in bringing a line-shaft system into the home sent aspiring inventors of mechanical personal cooling machines into a frenzy of creativity; undoubtedly, they hoped to profit from an invention they knew was likely to be a money-maker.

James Barron thought he had the answer in 1830 when he patented a fan with a clockwork power unit that could be carried from room to room. The fan proper, however, had to be firmly attached to the ceiling, which meant that the purchaser of the Barron system was required to modify a number of rooms in order to be cooled in the place he wanted to sit or lie down. Apparently recognizing this as economically unsound, Barron returned to the Patent Office the following year with a revised design that incorporated the fan and its power unit in one heavy—but movable—package.

A rendering of Barron's first fan design was prepared by Charles Lewis Fleischmann, a draftsman employed by the U.S. Commissioner of Patents to reproduce some of the 16,000 models and drawings lost in the calamitous Patent Office fire of 1836. Fleischmann seems to poke sly fun at the inventor in this drawing (SMITHSONIAN, September 1975), suggesting that perhaps the work involved in winding the apparatus and hauling it from room to room would so exhaust the user that he would sleep through the cooling cycle. He shows a man slumbering on a lovely Greek revival couch, an unlighted pipe slipping from his hands and a newspaper at his side that calls itself the *Hard-working Men Journal.* The paper's headline reads "Hard Times."

One or two inventors approached the matter of personal "air conditioners" with greater precision, realizing that the effort required to cool the whole body was substantially greater

Rocking chair armed with bellows and adjustable air hose was patented in 1869.

Sitting on chair compresses springs, which winds clockwork to power the fan.

than cooling just those human parts that invariably got the hottest. Daniel Linzie of Petersham, Massachusetts, designed a device (p. 116) in 1849 that went right to the heart of the problem. His rocking-chair operated bellows was connected to movable tubes that could aim jets of air at wrists, armpit and neck, precisely those points where arterial flow is nearest the surface of the skin. Later, in 1869, another jet rocker, designed by Charles Singer of South Bend, Indiana, was patented that blasted air from a carved snake (left) positioned just above the head of the chair's occupant. While this curious cooler operated on the same principle as the Linzie rocker, its effectiveness was probably due as much to sheer terror as to moisture evaporation.

Charles Gale undoubtedly was thinking about a mosquito repellent when he designed his spring-powered helical fan in 1860; one or two back-and-forth swings of the huge net fan blade on a hot day must have routed airborne pests as well as heat, for he called it an automatic mosquito fan.

William Bruton, on the other hand, concentrated his personal air-condi-

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In an age when a shave and a haircut were also five cents, a cartoonist spoofed new popularity of electric fans with curbside-breeze-for-a-nickel kiosk model.

tioning efforts on a simple treadle fan that could be attached to a table or ledge at the discretion of the operator. It could be powered at whatever speed desired by an unoccupied foot while the attention of the "coolee" was directed elsewhere.

A most elegant improvement in mechanical fans was submitted by Joseph M. Belcour of Paris in 1872. Operated by a spring fusee from which a chain of gears moved a gracefully shaped folding fan, this table or desk fan was about as small as a fan could get and still be useful.

Three things contributed to the advancement of personal cooling in the 1880s: Thomas Edison invented a commercially practical system for the manufacture and transmission of electricity; small, reliable electric motors came on the market; and Schuyler Skaats Wheeler put blades on one of the latter and plugged it into the system, thereby receiving credit for the invention of the world's first electric fan.

Wheeler, an energetic electrical engineer and manufacturer as well as fan inventor, began his professional life as an assistant electrician in the Jablochkoff Electric Light Company, but soon obtained a place on Thomas Edison's staff and was present on that historic occasion in 1882 when the Pearl Street Station in New York introduced an incandescent light system to the world. New Yorkers of the time, however, best remembered Wheeler as the expert on the Board of Electrical Control who was charged with placing all power lines in the city underground. So diligently did he carry out his orders between 1888 and 1895 that offending poles were often removed by force; one can imagine them being yanked from their moorings in the dead of night when more peaceful (and time-consuming) measures had failed.

By 1891 there were three million light-bulb sockets installed throughout the cities of America, many of which became the outlets for a number of different electrical appliances. The idea of combining the first two letters of the word electricity with a whimsical version of the Spanish lan-

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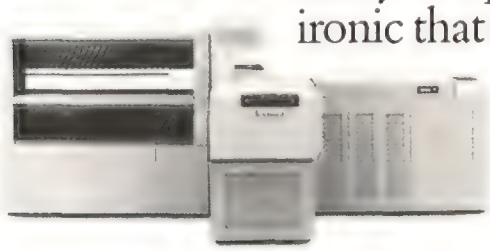

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"Ice chair" with shower head and air blower was heat-wave victim's daydream.

guage occurred to the Hotpoint Company, and they marketed an entire line of electrical timesavers as El Stovos, El Boilos, El Tostos and El Warmos for their electric stoves, immersion heaters, toasters and foot warmers, but for some odd reason they failed to advertise an El Fanno.

Other manufacturers, however, pushed ahead where Hotpoint did not, and if a company like Curtis and Crocker in 1886 went a little wide of the mark with their combination electric light and table fan, a hybrid that appeared to imperil the most dexterous fingers trying to turn off the light while staying cool, the design of the electric fan was standardized by most manufacturers well before the turn of the century. By 1890 the General Electric Company was marketing a six-bladed model enclosed in a sinuous wire safety cage and mounted on a heavy cast-iron pedestal, quite similar to many of the fans in production today.

Small improvements made a big difference, such as the oscillating device that moved air over a greater area and—perhaps the most effective addition of all—the strings of yarn tied to the fan guard which signaled to everyone that the fan was on and doing its duty. One might suspect that this improvement did not come from the drawing boards of industry.

Significantly, in rural areas where electric systems would not fully penetrate for another half century, the need for mechanical fans produced some exotic forms. A little hot-air fan displayed in the National Museum of American History utilizes an alcohol flame to power a small hot-air motor that in turn drives a standard four-bladed fan. Although appearing to work against the condition it was meant to correct, the Lake Breeze Motor built by William J. Strong of Chicago, Illinois, about 1900, can generate considerable wind when achieving its rated .0015 horsepower.

C. T. Fardwell, a plumber from Baltimore, Maryland, utilized tap water to power his single-bearing, impulse turbine domestic fan, an economical approach to cooling since water, unlike electrical power, was metered at a flat rate in many cities around the turn of the century.

Today the high cost of energy is slowly opening the windows of the nation as Americans everywhere seek alternatives to the notion of air-conditioning entire rooms whether or not they have anyone in them. Unfortunately, an open window does not always invite a cooling wind, a hard fact of summer life recognized long ago by legions of inventors who spent their time and money on the idea of making a breeze and getting it to go exactly where they wanted it to go. Linzie was on the right road when he patented his rocking chair jet cooler back in 1849, but brilliant

1849 bellows rocking chair had tubes for perfumes, to deodorize as well as cool.

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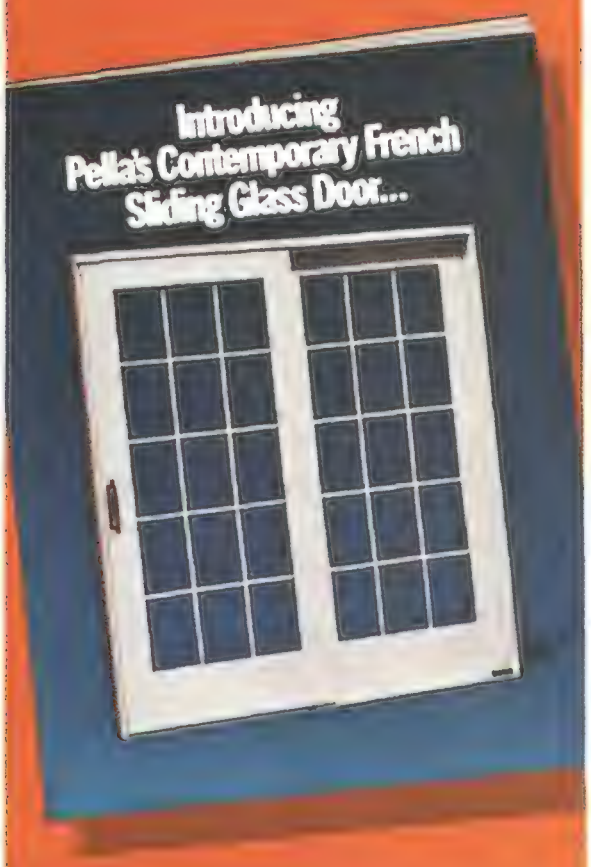

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Clockwork-driven fan was designed to cool sleepers and drive away insects.

The mechanism was wound to run for 6½ hours, providing a cool night's sleep.

as this idea was it needed modern technology to make it truly useful.

A few years ago John Hoke, a Park Service employee working on the Mall on a stifling summer day, showed up wearing a solar-powered "hat fan." He had installed a fan blower inside a pith helmet, which sucked in air through a hole at the top of the helmet and pushed it down past his hair and out the bottom. The blower was powered by solar cells mounted on top of the hat. He was a sensation wherever he went because it seemed (at least to his admirers) that he was staying a lot cooler than they were. Perceived by some as a civil servant desperately escaping the system, in fact the fellow is a pathfinder, a promoter of a genuinely functional personal fan that can be worn like a suit of clothes or a pair of eyeglasses. "I built it more or less as a novelty," Hoke says now. "It was intended as a joke, but it turned out to be no joke at all. It worked—and I still use it."

John Hoke's hat fan could be the prelude to a renaissance in the design of domestic fans based upon the microminiaturization of electric motors, such as the McLellan Micromotor developed in 1960, which was rated at one-millionth horsepower, weighed 250 micrograms and had 13

HOW TO USE A SELF-SERVICE GAS STATION

YOU CAN SAVE MONEY BY DOING SIMPLE CAR MAINTENANCE YOURSELF.

Gasoline or diesel fuel usually costs less at a self-service station. But too many people think that filling a fuel tank is all there is to self service. You'll do your automobile the most good if you also include a few simple maintenance procedures.

Most self-service pumps have easy-to-follow directions printed right on them. Before you drive into a self-service station, it's helpful to know whether your car takes leaded gas, unleaded gas, or diesel fuel, and also where your fuel tank is located, so that you can pull up to the proper pump and have the fuel tank close at hand. The type of fuel your car requires should be printed on the instrument panel, and the fuel tank location can be found in the owner's manual.

If you don't find instructions on the pump, here's what to do at most stations: 1. Turn off the engine. 2. Remove the fuel cap. 3. Remove the nozzle from the pump and turn the pump lever to "ON." 4. Place the nozzle in your fuel tank and squeeze the trigger. 5. When the trigger clicks off, remove the nozzle from the tank and turn the pump lever to "OFF." 6. Replace your fuel cap.

There are some things, however, that the directions may not tell you. Fuel fumes are highly flammable, so you should never smoke at a service station. Also, fuel caps are easy to forget and lose, so when you remove the cap try to wedge it in between the door to the tank and body of the car, where you're not likely to forget it. All 1981 and most older General Motors cars have fuel caps that twist on and then click when secure.

When you're filling up, try to avoid topping off your tank, since it may overflow. If fuel does spill on your car, you should wash it off as soon as possible, to avoid paint damage.

After you fill your tank, remember to clean your windshield. If you've been driving in bad weather, be sure to wipe off your side mirrors and headlights, too.

A quick-maintenance inspection can help you spot potential trouble. You don't need any expensive tools—just a good quality tire gauge, a rag or paper towel, an oil can spout kept in a plastic bag, and a jug of premixed windshield washer fluid, such as GM Optikleen.

To check your engine oil, pull out the dipstick, wipe it clean, insert it again, then pull it back out. The oil should be between the marks labeled "FULL" and "ADD." If it's below "ADD," add a quart of the oil recommended in your GM owner's manual.

You should also check the coolant level. Most GM cars have a see-through recovery tank. If the level looks low, add coolant to this tank. Never remove the radiator cap when the engine is hot, because pressurized coolant may overflow and burn you.

Periodically check your brake, transmission, and power steering fluid levels. Your owner's manual tells you how. Remember to keep the windshield washer reservoir filled with fluid, too, especially in the winter when you use it most often.

Most GM cars are equipped with maintenance-free batteries. But it's still wise to make sure their cables are on tight and the ends aren't frayed. Look for fraying, cracks, or other signs of wear on belts, too.

Look at tires for signs of wear or worn-out edges which can indicate improper inflation or the need for alignment. Once a month, you should use a tire gauge to check the pressure. In GM cars, the recommended pressure is on the left front door edge or inside the glove compartment. Recommended pressure is for cold tires, so check them before you drive more than a mile.

You'll be putting self-service stations to their best use if you include maintenance checks in your stops for gas. Your GM owner's manual can be an invaluable guide to proper car care. Please use it.

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parts assembled under a 40-power microscope. The inventor, William H. McLellan, felt at the time that his device was good for powering flea circus carousels, but the availability of such technology allows one to indulge in some flights of fancy about the fans of the future.

The "I'll-follow-you-anywhere" earring fan is an example of the kind of functional little neck and ear cooler that could be in production within a few years. No larger than bees (and about as noisy), two of these units would offer the wearer comfort under any number of steamy conditions.

On the other hand, the "Take-it-on-the-chin" breeze maker would be a robust gentleman's machine that doubles as a tieclasp when not on duty as a supplier of comfortable air to that junction of neck and collar where perspiration irritates one and wilts the other.

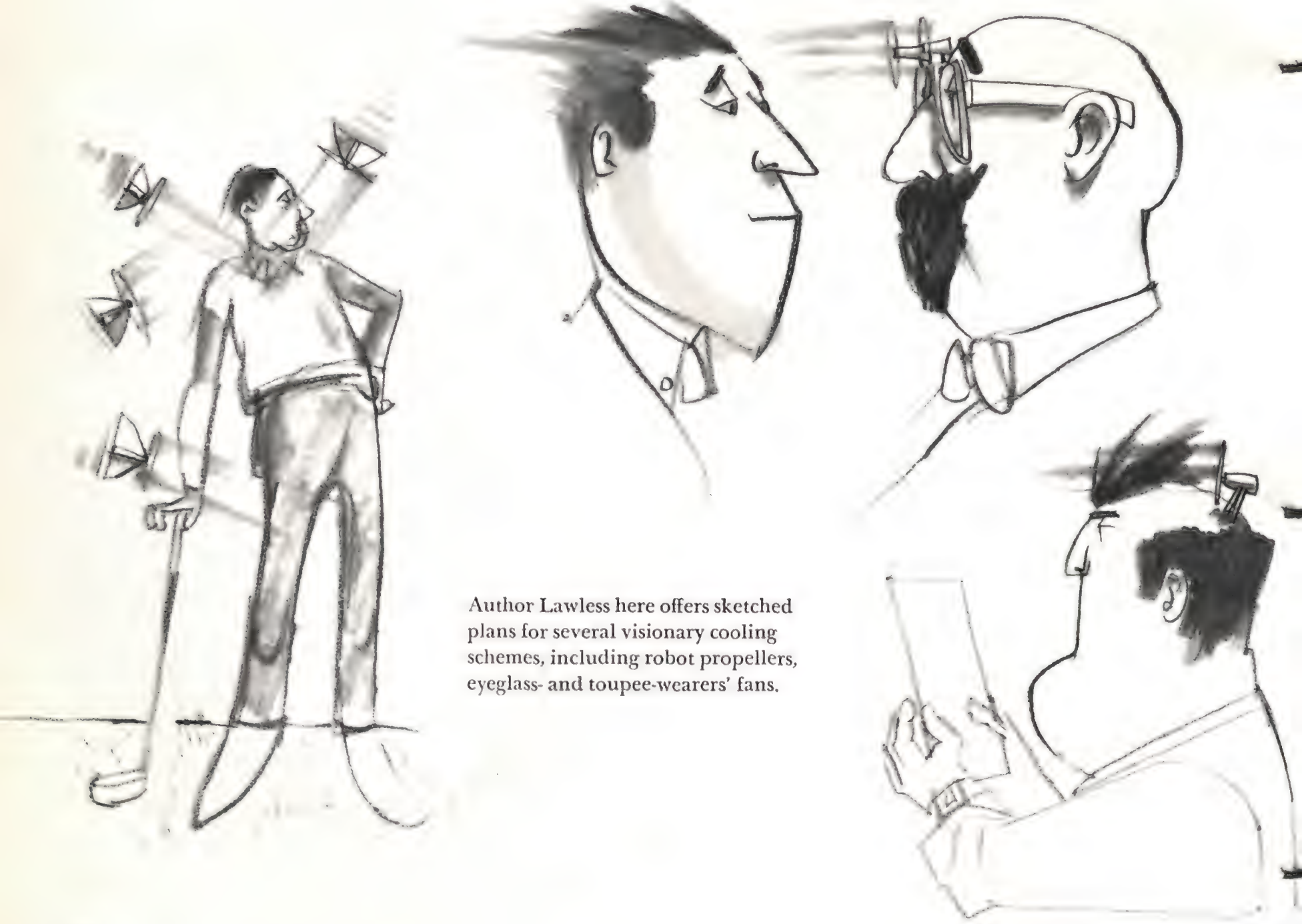
"Toupee-or-not-toupee" is a specialized fan for a highly embarrassing condition. As wearers of hairpieces know all too well, summer heat leads to an itching of the scalp that under most circumstances cannot be alleviated except by surreptitious scratching. This unit perches saucily on the back of the head looking for all the world like a cowlick while directing a steady stream of relief to the person below it.

Eyeglass wearers could be doubly refreshed by the "Here's-looking-at-you-kid" draft makers that can be adjusted to offer a friend a neighborly blast or simply focused on that particular part of the ocular area needing a cooling down.

A somewhat radical departure in personal cooling devices might be the "Pit-stop," a hurricane maker designed for fast relief to those areas of the body that tend to develop prickly heat if not properly ventilated. The possibility of creating a lifting vortex if the fan accidentally turns in the wrong direction and the resulting unplanned vertical flight could be a situation far more hazardous than a simple skin rash. A thorough aerodynamic study is recommended before this device is released to the marketplace.

The ultimate personal cooling machine would be a miniature, free-flying, homing propeller that receives its power from a transmitting station in space. Hovering about its owner singly or in squadrons much as if they were benign gnats, these fans of the future suggest that the work of Schuyler Skaats Wheeler begun so many years ago is capable of infinite variation and improvement.

After all, it only takes one hot summer day in a stifling room to make fan inventors of us all.



Author Lawless here offers sketched plans for several visionary cooling schemes, including robot propellers, eyeglass- and toupee-wearers' fans.

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Book reviews

One Third of a Nation: Lorena Hickok Reports on the Great Depression
Edited by Richard Lowitt and Maurine Beasley
University of Illinois Press, $18.95

Inflation's pinch and high interest rates fade into perspective for readers of *One Third of a Nation,* a collection of letters of an observant reporter, written nearly 50 years ago, as the nation wallowed in the backwash of the Great Depression.

For Lorena Hickok, the assignment was too tempting to turn down, despite her status with the New York *Daily Mirror* and the Associated Press: roam the country, monitor conditions and relief programs and report directly to Harry L. Hopkins, administrator of the Federal Emergency Relief Administration. Later, Hopkins said that Hickok's letters would be "the best history of the Depression."

Hickok's efforts to publish the letters failed, but five decades later two academicians have helped confirm Hopkins' judgment. Richard Lowitt, chairman of the department of history at Iowa State University, and Maurine Beasley, associate professor of journalism at the University of Maryland, have edited from the letters a vivid and compassionate account of the nation's agony.

Contemporary problems pale significantly as the reader travels the backcountry with reporter Hickok, circa 1933:

"Up in Northampton county [Pennsylvania] I ran into cases where unemployed tenants went out . . . and worked out the landlord's taxes on county roads, thereby keeping him from losing his property and earning a little of their rent. . . .

"Clothing for the unemployed in Pennsylvania has apparently been given large-

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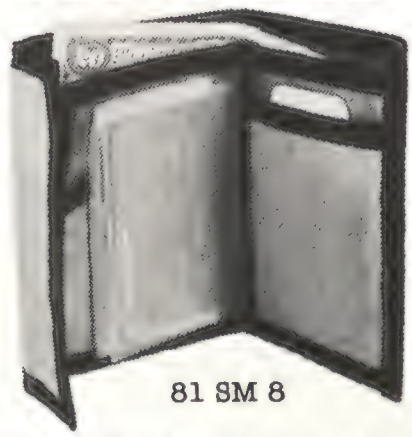

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ly—if not entirely—by private agencies. They are running out of clothing now. The Red Cross, I was told, is now down to the point where it is giving out only cloth—and sometimes without thread or buttons. There is a crisis developing over the lack of shoes. School opens early in September, and practically everywhere I went I heard . . . 'Our children must have shoes, or they can't go to school.' . . . I found one man re-soling shoes for his family with pieces of automobile tire."

Fearing violence from the miners in eastern Kentucky's coalfields, Hickok raced to Middlesborough in an ancient

Carl Mydans' photographs captured the painful reality of the Depression years.

car to confer with the head of the relief staff there, who reported: "They came all right, but only a hundred. . . . A few of them formed an organization and elected me president! . . . By the time the speaking was over, most of the crowd had drifted away. . . . Why, those people couldn't put on a riot! They were so starved that they didn't have the physical energy."

Through drought and dust storm, breadline and soup kitchen, bureaucratic tangle and politics as usual, Hickok wades with a kind of undiminished fervor. The early success of the Tennessee Valley Authority and its implications for the area excite her—but at the same time she is depressed with the stunted corn grown on the rocky soil of Tennessee. Overall, she retains her optimism. The

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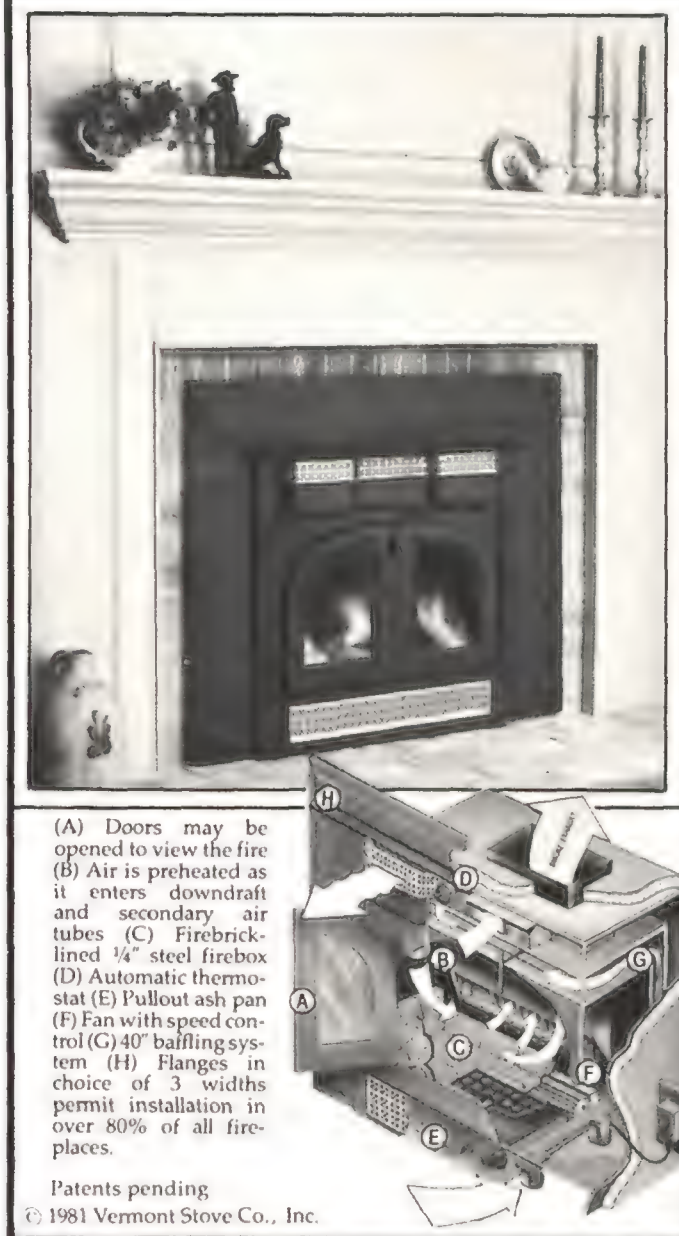

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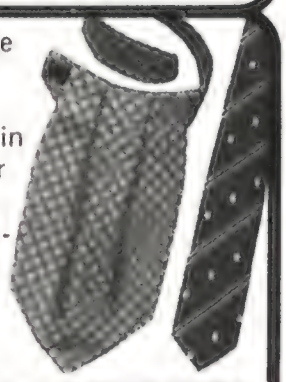

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people, she comments, "seem to be trusting to God—and the Government." Her appraisal of the prevailing attitude: ". . . at least, Roosevelt is trying. He's doing something!"

For me the Thirties were brought sharply back into focus by a letter to Hickok from her Washington headquarters authorizing her to travel the United States in 1934—for five dollars a day and five cents a mile! For any reader—whether Depression child or of a later generation—nothing could better demonstrate that this happened a long time ago.

It's not an easy read, this unrelieved matrix of misfortune. I made it in four sittings. With Hickok, I turned away from a transient shelter dormitory in Denver, which she found too malodorous to enter. I recoiled from many of the bleak photographs, black-and-white pictures of squatter communities, "Hoovervilles," food lines, skid rows, blank faces, hunger, degradation, grinding poverty.

Hickok comes through as an even-handed reporter, aware of but seemingly unimpressed by the Communist effort to turn mass misery into revolution. From California she quotes an AP colleague: "The Communists . . . thought back in the late winter of 1932-33 that the revolution was right at hand. Now they say Roosevelt has postponed it for five or six years. . . ."

Indeed, Roosevelt is the towering figure in this book, for friend and foe, for great and small, for Hopkins and Hickok. Even Lowitt and Beasley took their title from FDR's Second Inaugural Address: "I see one-third of a nation ill-housed, ill-clad, ill-nourished."

I once heard comedian Milton Berle tell an audience that inflation exists when money won't buy as much as it did back in the Depression when you didn't have any. That one-liner loses zest as the reader confronts in detail this excellent history of the unemployed and dispossessed Americans, circa 1933-34.

Lucien Agniel
English Department
Davis & Elkins College
Elkins, West Virginia

Matthew Arnold—A Life
Park Honan
McGraw-Hill, $19.95

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mediately struck by what a sympathetic and curiously prophetic figure Arnold was. Dominated by a determinedly rationalistic though zealous father, who was himself a noted headmaster (the famous Arnold of Rugby), young Matthew—or "Crabby" as he was called because of his crooked legs—set out to forge his own character and destiny. If the forging often takes a rather destructive bent—witness the severe burn from inadvertently discharging a firearm—nevertheless by late adolescence he had acquired depth enough to impress both Charlotte Brontë and George Sand, who spoke of him as *"un Milton jeune et voyageant."*

By the time he entered Balliol College, Oxford, he already had plunged into that imagistic "sea of intuition" which defied the "damned pedantry" he so despised. In poems from this period, winds howl, waves roar and whirl, "sea-weed sways," and "sea-snakes coil and twine" as daydreams of an unrequited love affair dominate. Later, in true Viconian fashion, the tide retreats only to return, bringing —along with marriage—a new-found serenity and confidence that resulted in one of the most beautiful poems in the English language, "Dover Beach":

> The sea is calm to-night.
> The tide is full, the moon lies fair
> Upon the straits....

The millions of schoolchildren who, against their will, have dared the luminous depths of this poem might be surprised to learn that Arnold—as one of Her Majesty's School Inspectors—like them spent the majority of his daylight hours in dark, dingy classrooms which, incidentally, he abhorred just as much as they. On weekends and holidays, he romped with his rapidly expanding family through the woods and meadows of Fox How, the small family estate near Wordsworth's famed Lake District.

School inspecting was an enormously strenuous job, both physically and psychologically, because it entailed not only the tedium of bureaucratic routine but also the discomfort of a homeless existence. The most distressing elements, however, were the schools. There is nothing poetic about hunger, vermin, illiteracy and disease. Arnold felt a growing need to espouse social reform.

Here, then, was one explanation for his gradual turning away from poetry. The other reason was more subtle. "Rustum, my father," he wrote—obviously

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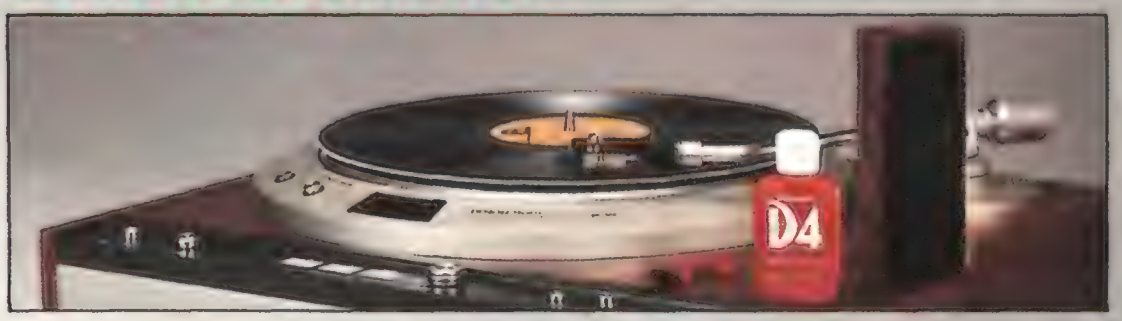

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thinking of his own parent—in a poem entitled "Sohrab and Rustum,"

> . . . who I hoped should greet,
> Should one day greet, upon some well-fought field,
> His not unworthy, not inglorious son.

Arnold would never be at peace until the late Dr. Arnold's aspirations for him had been fulfilled. For such expectations, poetry would not suffice. Interestingly, one of his last poems was not only a tribute to his father but seems—especially in view of previous metaphors—a poignant farewell to poetry itself:

> . . . no one asks
> Who or what they have been,
> More than he asks what waves,
> In the moonlit solitudes mild
> Of the midmost Ocean, have swelled,
> Foamed for a moment, and gone.

Except for occasional verse, future ideas would be couched in prose. Yet there were compensations, not the least of which were the masters he chose to emulate: Emerson, Newman, Sainte-Beuve, Spinoza, Voltaire, Burke. His aim was of the highest order; namely, to exhort a nation "to healing measures and an attractive form of civilization." The essays began to be widely read and debated. Their popularity was based not only on pertinent content but also, as Lionel Trilling said, on a "style which kept writer and reader at a sufficient distance from each other to allow room between them for the object of their consideration." He ruminated on Tolstoy, Heine, Joubert; on philistinism, on Celtic literature; he emphasized the need for humanity in education; he warned against skepticism undermining Western culture. Disraeli, meeting him for the first time, remarked, "Now you are well known, you have made a reputation. But you will go further yet. You have a great future before you, and you deserve it."

The center of Arnold's life, around which all else pivoted, was his family (his wife, Fanny Lucy, and their four boys and two girls), but now, in the midst of a gratifying success, a series of dreadful events occurred, the first being the death of his infant son, Basil, soon followed by that of 16-year-old Tommy. Four years later, tragedy struck again, and this time it was particularly devastating for it involved Arnold's favorite child, his beloved "Budge." A diary entry after Budge's funeral is testament enough of a mind deeply aggrieved:

> "hard rain
> rain
> rain
> rain in morning
> rain in morning
> rain in evening
> rain
> rain in evening
> rain all day
> rain at night
> rain."

Despite the tragedies, Arnold persevered, even embarking in 1883, and again in 1886, on a lecture tour of the United States. Returning to England, his last action (in April 1888) was almost symbolic in its implications: braving a history of angina pectoris, he ran and cleared a railing just as, in his Oxford days, he had won a bet by making a fantastic leap over the college wall. Turning away, he beamed with triumph. Next day, he was dead of heart failure.

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For *Matthew Arnold—A Life*, Park Honan, coauthor with William Irvine of an acclaimed biography of Robert Browning, has amassed much fresh material from hitherto unpublished sources, and the result is a book rich in detail. In addition, he makes a good case for calling Arnold "the Victorian who matters the most." Arnold himself—though quick to admit his failures—was shrewd enough to divine his successes: ". . . We have prepared currents of feeling," he wrote toward the end of his life, "we have kept up our own communications with the future."

Suzi Mee
New York poet and critic

Photography in Print: Writings from 1816 to the Present
Edited by Vicki Goldberg
Simon & Schuster, $22.50

"To fix fleeting reflections is not only impossible as has been shown by thoroughgoing German research, but to wish to do it is blasphemy." Thus did the Leipzig *City Advertiser* greet the news of the discoveries of Niepce and Daguerre in 1839. And the flow of words about photography, far from being stanched, has by now reached flood level. For this anthology, Vicki Goldberg has attempted to select some of the best with an eye to "illuminating some corner of photographic history or aesthetics," along with a few pieces "just for fun." Though many saw photography's potential from the start, others thought it would replace painting.

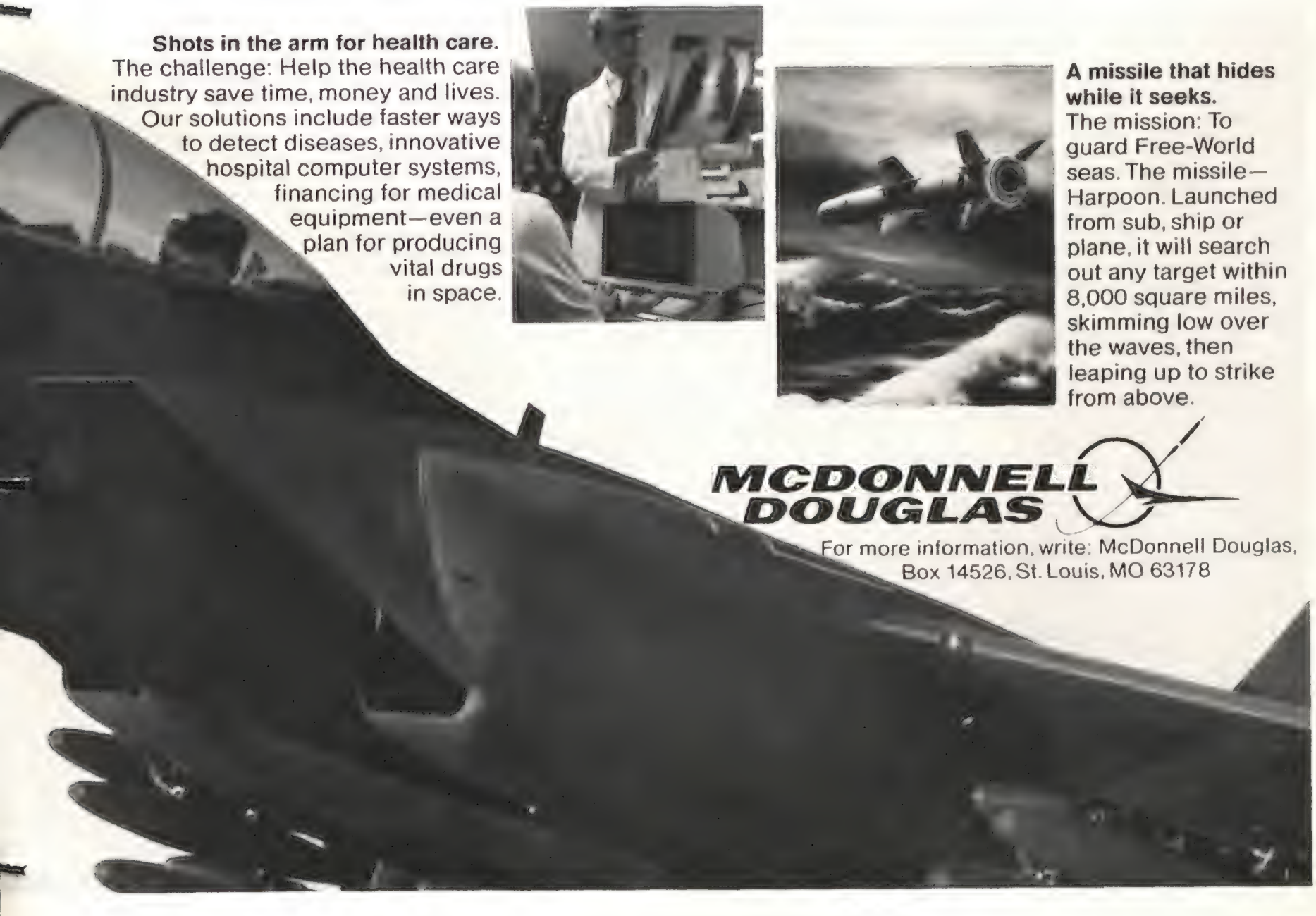
Balzac feared the camera would strip away one of the spectral layers the body was made of, a fear more understandable when one remembers that sitting for a daguerreotype meant spending ten minutes in a sort of vise that one sitter likened to the Nuremberg "Iron Maiden."

Belief in the power of the camera's eye took different forms. Oliver Wendell Holmes, who invented the handheld stereoscopic viewer, noted that while in a painting one sees only what the painter saw, in a good photograph there are "as many beauties lurking, unobserved, as there are flowers that blush unseen in forests and meadows."

As the wonder wore off, more emphasis was placed on the photographer's responsibility for the product. Julia Margaret Cameron approached the task of capturing the inner features of great men like Darwin and Tennyson with a spirit of reverence approaching prayer. Pictorialists such as O. D. Hill and Henry Peach Robinson doctored their prints to make them painterly. Such techniques fell into disfavor in the 20th century. Alfred Stieglitz, with disciples Edward Steichen, Paul Strand, and other "straight" photographers, favored sharp focus, glossy paper, and no darkroom trickery. Questions of art were much less vital for photographers like Lewis Hine, who helped bring about social change with his pictures of child laborers, or photojournalist W. Eugene Smith, who talks about his Minamata series, exposing the effects of mercury poisoning on a Japanese fishing village.

Well-known people from outside the field reflect here on photography. Baudelaire saw it as a threat to imagination; G. B. Shaw, an amateur photographer, defended it with typical pugnacity.

Critical writings reflect the multifaceted nature of the subject. Richard Rudisill, on the daguerreotype in America,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and Barbara Novak, on the early American landscape photographers, both mention the influence of transcendentalism, a force that was to persist in the work and words of, among others, Walker Evans and Minor White. Lewis Mumford and Wright Morris are concerned, respectively, over the proliferation of images in our time and our seeming preference for the image over the real thing; A. D. Coleman breaks new ground in his exploration of how photographers manipulate their subject matter; Susan Sontag takes a long, hard look at Diane Arbus and her world of freaks; and Janet Malcolm examines two recent, and to her disturbing, trends: the inclusion of snapshots as subjects for serious artistic consideration, and the deliberate faking of snapshots by professional photographers.

Vicki Goldberg, whose opinion of much of the writing on this subject by her fellow critics is not high, offers her selections as "some plums from a limited orchard." They are plums indeed.

George Kittle
New York writer and critic

Eisenhower's Lieutenants: The Campaign of France and Germany 1944-1945
Russell F. Weigley
Indiana University Press, $22.50

Thirty-seven years after D-Day, June the Sixth is a date still firmly fixed in the nation's collective memory, although the duty to commemorate it is satisfied nowadays by a brief note on the evening news and perhaps by the late-evening revival of an aging film about a war that for a whole generation of Americans was *the* War. It is appropriate that the anniversary of the Normandy landings was chosen as the occasion for the publication of Russell Weigley's *Eisenhower's Lieutenants*, which charts the flow of fighting on the Western front from the initiation of Operation Overlord (D-Day) to Germany's capitulation 11 months and nearly 800,000 Allied casualties later. The work of an accomplished scholar, this book should rank as the finest single-volume history of the American war effort in the European theater.

But *Eisenhower's Lieutenants* is not so much a book about battles as it is about the generals who planned them. Weigley, Professor of History at Temple University, focuses on the actions and personalities of army and corps commanders, air and

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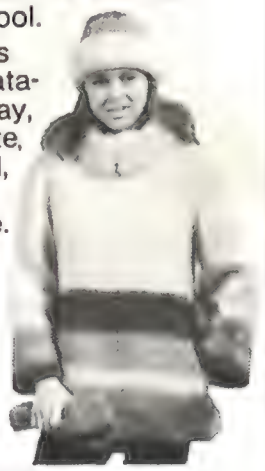

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naval chiefs and top staff officers in order to assess the merits and deficiencies of Allied forces. Familiar portraits emerge—of Montgomery, whose contemptuous manner and conspicuously cautious tactics were a recurrent source of friction and resentment; of Bradley, the "GI's General," who could not conceive of an unorthodox move; and of Patton, disdainful of his colleagues, whose erratic genius often drove him across the boundary between audacity and foolhardiness.

Although the British generals believed the truth of the adage that "He who has not fought the Germans does not know war," their American counterparts—many of whom, like Eisenhower and Bradley, had not seen action in World War I—were nothing if not self-assured. The British were not easily convinced that the Americans had learned their trade well enough, however, and they resented that the United States, with its preponderant manpower and resources, had preempted leadership of the alliance.

But Eisenhower, the hero of the book, succeeded in engaging the respect of British and American generals and the loyalty of his integrated staffs. Board chairman, diplomat, father confessor and stern headmaster as the situation demanded, he insisted on being an Allied rather than an American commander. For him, the Anglo-American alliance was not just a meaningful temporary relationship but a marriage of permanent interests.

Without glossing over the seriousness of animosities within the Allied camp, Weigley is able to put them in perspective. The approaches taken by the generals to the business of war were shaped by the traditions of their respective armies and by their backgrounds in different service branches. The crucial issue that divided their councils was the choice of the strategic concept to be applied in coming to grips with the enemy once a tochold had been established in Western Europe—whether Allied forces should be deployed to destroy the German fighting machine along a broad front, as Bradley demanded, or concentrated, as Montgomery urged, for "one really powerful and full-blooded thrust" aimed at Berlin.

Weigley relates American strategic thinking to two doctrines of warfare. One doctrine—reliance on mobility—was a legacy of the frontier experience and the darling of Patton, the horse soldier, who champed at the bit to be let loose to

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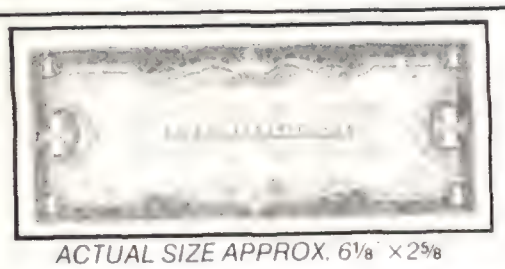

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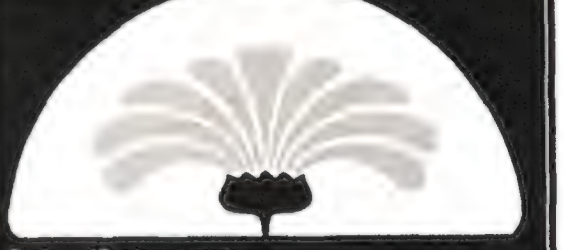

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probe for weak points in the enemy's defenses and fight his way through them into Germany. This approach, calling for constant and rapid movement, was ideal for an army skilled in the use of machines and adept in improvisation. The rival doctrine, whose historical development the author traced in an earlier book, *The American Way of War*, drew on the example of Civil War battlefields. It depends on the ability to bring to bear overwhelming manpower, firepower and equipment in direct engagement with the main body of enemy forces. Its application in Europe ruled out the mobility advocated by Patton and the concentration of forces urged by Montgomery.

For all the historical-mindedness that Weigley attributes to them, American commanders apparently were not prepared for the sustained campaign that followed the Normandy landings. Because of the disjuncture between the two doctrines, they could never agree on a clear and unified concept of the war that they were fighting. As a result, neither doctrine was consistently applied.

Eisenhower's Lieutenants is unabashedly a scholarly book whose author makes absolutely no concessions to the lay reader—not the sort of thing, perhaps, that recommends itself for a casual read on a summer's afternoon. But Weigley's well-paced narrative and persuasive analysis, packaged in lean prose, is virtually guaranteed to hook veteran armchair warriors into a long and reflective study of this look at the European campaign.

Robert Rinehart
The American University

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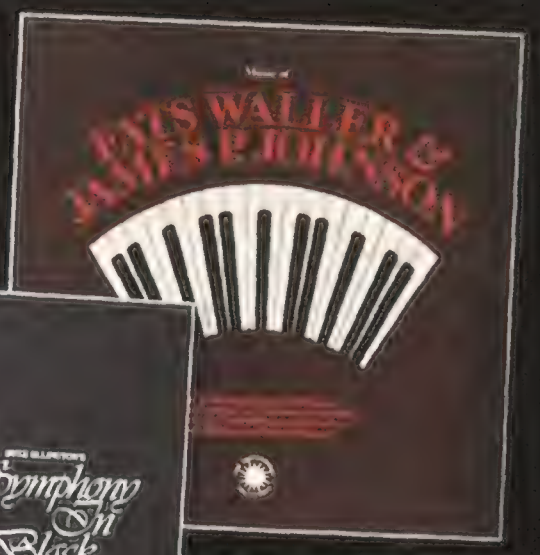
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Walnut side chair for the Earl of Scarsdale has family coat of arms. The Queen Anne style shows an Oriental influence: the clawed feet are probably copied from ivory dragon carvings. Anne's reign ended in 1714, but the chair was made c. 1730. Styles can outlive their namesakes, so, when dating, check *latest*, not earliest features.

Cooper-Hewitt Museum

The Metropolitan Museum of Art. Bequest of A T Clearwater, 1933

American silver tea set in late neo-classical style, c. 1790. After the revolution colonists no longer felt obliged to mold their silver in classic Greek and Roman designs; they delighted in silver characterized by oval forms and light, delicate engraving. The sculptor of this superb example: Paul Revere.

Courtesy of the Margaret Woodbury Strong Museum. Harry Burkhardt, Photographer

Long before electronics, master toy-makers developed use of springs and strings to a fine art, creating motion enough to delight any child. This particularly enchanting Jack-in-the-Box (German, c. 1915) is hand carved and painted, and the necessary spring cloth-covered.

The Metropolitan Museum of Art, Gift of R. Thornton Wilson, 1950, in memory of Florence Ellsworth Wilson

Delicacy and earthiness meet in Franz Anton Bustelli's 18th century figures of Italy's *commedia dell'arte*. Taking as their subjects performers noted for their bawdiness, the pieces are considered among the finest porcelain achievements ever.

The Metropolitan Museum of Art, Fletcher Fund, 1961

Was time's passing ever more exquisite? This French clock, c. 1720, has an oak case attributed to the renowned cabinetmaker Cressant, and is adorned with exotic tortoise-shell, brass marquetry and gilt-bronze mounts. Numerals are on enamel plaques. But the cabinets for such clocks were often more notable than their accuracy.

The Metropolitan Museum of Art, Gift of Dorothy A. Gordon and Virginia A. White in memory of Madge Ashley, 1975

From China c. 1875, this lady's coat shows exquisite needlework in a fascinating combination of fabrics. The base—of plain wool broadcloth—is embroidered with colored silk and gilt yarns as well as figured silk tape. The borders and sleeve bands, similarly embroidered, are satin.

original or a reproduction? how to tell for yourself.

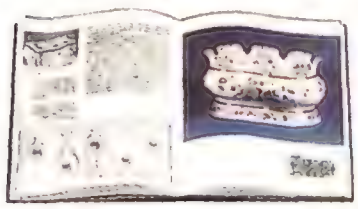
Cooper-Hewitt Museum

The vase pictured at left is not only authentic (as are all the antiques shown here) but a treasure dating back to the Ch'ing dynasty of the 1700s. The fish shown, the carp, is the Chinese symbol for long life. So exquisite was the porcelain of this period that King Augustus the Strong traded an entire regiment of cavalrymen for 117 pieces!

Every antique has similar stories carved in its wood, molded into its clay. Stories about where the piece came from and why it was made. About times and attitudes—hopes and dreams—of long ago. About whether it's an original or an imitation, or what stylistic period it came from. That's why antique collecting is as much for the knowledgeable as it is for the wealthy. Even if you're a beginner you'll be amazed at the variety of objects that are available once you know how to recognize them.

But how do you learn what you need to know? Here's a beautiful answer: the new *Smithsonian Illustrated Library of Antiques,* prepared by the Cooper-Hewitt Museum, the Smithsonian Institution's National Museum of Design.

This unique Library indulges your love of beauty to the fullest. It's an unequalled feast for the eye, with exquisitely detailed color photographs of the world's most magnificent antiques.



And, with a sense of history and high adventure, it gives you the background and understanding you need. It tells you where the pieces were made, when, and by whom. And *why.* It describes the relationships of antiques to their lands and cultures. It follows them through war and peace, into protective homes and across oceans. It puts all the trends into perspective, showing you how to recognize styles, materials, manufacturers' marks. Volume by volume, from furniture to toys, from clocks to needlepoint, from pottery to jewelry, the Library builds into an easy-to-understand, sumptuously illustrated "course" covering all antiques.

If you're a collector now—whether your collection is a major hobby or just a few pieces—the Library will be of immeasurable value as a learning tool and a reference. Even if you're not an active collector, but just love and appreciate beautiful things, the Library will turn the world around you into a never-ending source of inspiration.

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Additional reading

Alaska corporations (p. 30)

Lost Frontier: The Marketing of Alaska by John Hanrahan and Peter Gruenstein, W. W. Norton, 1977

Alaska Native Land Claims by Robert D. Arnold, Alaska Native Foundation (Anchorage), 1976

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Grizzlies (p. 78)

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Night of the Grizzlies by Jack Olsen, Putnam's, 1969

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"The Great Grizzly Controversy" by Bil Gilbert, *Audubon*, January 1976

Man Meets Grizzly, collected by F. M. Young, Houghton Mifflin, 1980

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"Edison: Lighting a Revolution, the Beginning of Electric Power" (exhibition catalog), National Museum of History and Technology, Smithsonian Institution, 1979

"Mr. Mudge's Smut Machine et al" by Peggy Thomson, SMITHSONIAN, September 1975

"The Rebirth of Ceiling Fans" by Jackie Hanrahan, *Appliance*, February 1981

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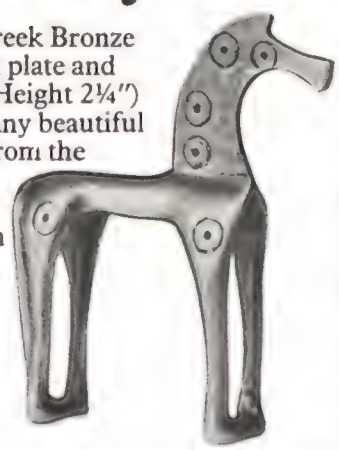

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Smithsonian highlights

After you've savored the celadons of the Koryo dynasty, the gold ornaments (opposite) and the superb Buddhist sculptures at the Korean art exhibit in the Museum of Natural History, take a look at the walls. And the surrounding space, all 12,640 square feet of it.

The exhibit, organized by the National Museum of Korea and the Asian Art Museum of San Francisco, is the inaugural show for the new Thomas M. Evans Gallery, the largest exhibit space of any Smithsonian museum on the Mall. The size and the flexibility—the fabric covered walls are adjustable—will accommodate both traveling and major in-house exhibitions which often have had to skip the Smithsonian for lack of suitable space.

The ground-floor gallery, which previously housed various ecology displays, is named after the New York philanthropist whose contribution made possible the spacious new hall. Already a popular piece of real estate, it's booked into 1983, with exhibitions including Hopi Kachinas, Bering Sea Eskimos, deep-sea photography and Hawaii.

Special August events

National Air and Space Museum

Jet Aviation New exhibit traces evolution of commercial and military jets.

The Solar System Family Album (August 1, 9 A.M.) Monthly sky lecture focuses on the images of five planets and on the spacecraft that took them.

Freer Gallery of Art

Korean Art (through September 15) Ceramics, painting and metalwork, third century B.C.-19th century.

Eastern Kufic Calligraphy Twelve Koran pages from 10th-12th-century Iran.

Turkish Art Ceramics, drawings, textiles and jade.

Japanese Fans Illustrates importance of fans in 16th-19th-century society.

A BOBBY-CAT OR A BOBBY-KITTEN

A blown-up version in full color of the June Smithsonian cover. The bobcat, rarely seen and seldom photographed. Looking like a beautiful house cat, can we say it's wild? And if it's wild can we not protect?

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At NMNH: Korean gold cap ornament

National Museum of Natural History
Two Contemporary Bird Painters in Oregon Territory (August 8-October 4) Oils and water colors by L. B. McQueen and J. J. Janoski of birds in their natural habitats.
5000 Years of Korean Art (through September 30) Major exhibit includes some 350 objects (above).
Contemporary Korean-American Arts (through September 30) Washington-area artists' exhibit, Learning Center Gallery.

National Museum of American History
The Commodores (August 12, 19, 26, September 2; 6 P.M., Carmichael Auditorium) U.S. Navy jazz concert.
Saturday Live! Country music concert, August 1; Takoma Brass Ensemble, August 15; both 2 P.M., Hall of Musical Instruments (p. 141).
Images of Labor (through August 26) Artwork based on American labor movement; related film series (call 357-2700 for details).
Perfect in Her Place (through January 24) Women at work in the 19th century.
Platinum Women Turn-of-the-century "platinotypes" of 52 fashionable women.

Hirshhorn Museum & Sculpture Garden
Larry Rivers: HM&SG Collection (through September 20) Some 40 works reflect artist's virtuosity and wit.

National Museum of American Art
George Catlin: The Artist and the American Indian (through September 13).
In Their Own Way (through October 4) Works by diverse group of artists.

Cooper-Hewitt Museum (New York)
The Moving Image (through August 16) Artwork for animation films.
Gardens of Delight (through August 23) Horticulture and its reflections in art.

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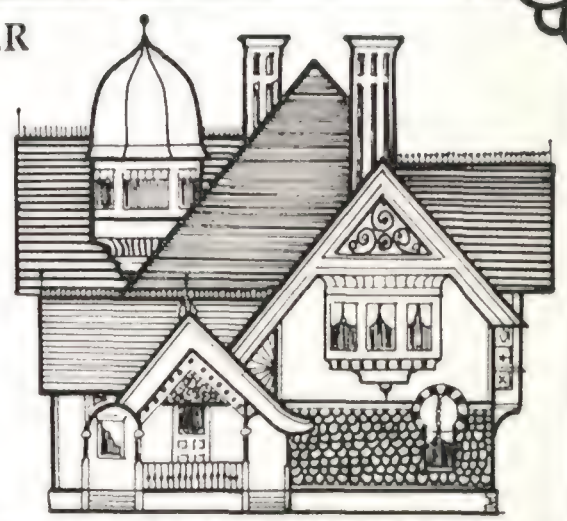

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National Portrait Gallery

Champions of American Sport (through September 7) Exhibit spotlights 100 athletes from 1830s to the present; related sports films.

Charles Willson Peale as Printmaker (through January 3) Portrait prints.

We Never Sleep: 50 Years of Pinkerton Men (through January 3) Saga of this detective agency (p. 60).

Renwick Gallery

Venini Glass (August 21-March 21) Retrospective exhibition of some 150 vessels from Venetian firm (below).

Animal Image: Contemporary Objects and the Beast (through August 30) Objects with animal motifs.

At Renwick: Glass by Tapio Wirkkala

Smithsonian events

For tickets to August Resident Associate Program events, call 357-3030:

Korea's Cultural Heritage (August 11, 6 P.M.) Lecture by Dr. Gari Ledyard.

The Art of Animation (August 13, 20, 27; 8 P.M.) Film series.

The Boston Tradition: Patrons and Painters (August 4, 6 P.M.)

Pissarro and the Idea of Impressionism (August 24, 8 P.M.) Illustrated lecture.

Biological Frontiers: Deep-Sea Life Discoveries (August 19, 8 P.M.)

Caribbean Gala (August 18, 7:30 P.M.)

Radio Smithsonian

Sunken Spanish treasure ships, George Catlin's Indian paintings and highlights from the 1981 Festival of American Folklife are among the August listings for Radio Smithsonian and Smithsonian Galaxy, broadcast nationwide. To find out which area stations carry either program, write: Smithsonian Office of Telecommunications, A&I 2472, Washington, D.C. 20560.

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Boulder, Colorado (August 1-30) *Beauties of the Coral Reef,* IBM Corporation.

District of Columbia (August 8-September 6) *Images of Old Age in America,* Federal Deposit Insurance Corporation.

Atlanta (August 15-December 20) *Impressions of the Steam Engine in America,* Atlanta Historical Society.

Pekin, Illinois (August 8-September 6) *The Story of a Goblet,* First National Bank & Trust Company.

Evansville, Indiana (August 29-September 27) *Photographs from the Collection of the National Portrait Gallery,* Evansville Museum of Arts & Science.

Elizabethtown, Kentucky (August 22-October 4) *Reflections:The Child in America,* Elizabethtown Community Center.

Baltimore (August 8-October 28) *The Men and Machines of American Journalism,* Maryland Science Center.

Oxford, Michigan (August 15-September 13) *America's Architectural Heritage,* Oxford Public Library.

Minneapolis (August 15-October 11) *Renaissance of Islam: Art of the Mamluks,* Minneapolis Institute of Arts.

St. Louis, Missouri (August 22-September 20) *Mexico as Seen by Her Children,* International Institute.

Dayton, Ohio (August 1-30) *Terminal, Station and Depot,* Old Post Office.

Erie, Pennsylvania (July 11-August 8) *Ride On!* Erie Historical Museum.

Rhinelander, Wisconsin (August 29-September 27) *Ride On!* Nicolet College & Technical Institute.

Casper, Wyoming (August 22-September 20) *Children's Art from People's Republic of China,* Nicolaysen Art Museum.

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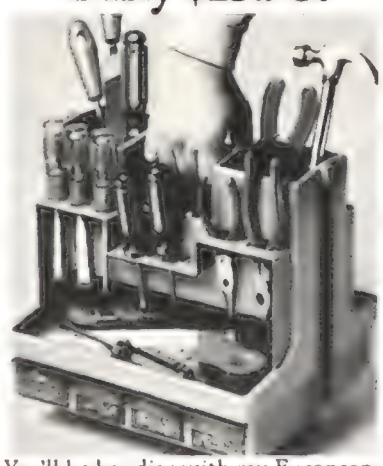

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The sound and the beauty

Leather-covered wooden serpent is early 19th-century wind instrument.

Figure and score decorate ivory frog on bow presented to Paganini.

The philosophy is this: a busy concert and demonstration schedule gives the Division of Musical Instruments a chance to show its stuff. "We've always felt the exhibit of a musical instrument should include its sound," says curator Cynthia Adams Hoover. Thus instruments are restored to top playing condition and musical scores are researched to match the historical periods.

If you go to the third floor of the Museum of American History at 11 A.M. weekdays, you'll "hear" the exhibit. That's when musicians play the rare and beautiful specimens—strings, keyboards, winds and various American folk and popular instruments. (For details, call 357-1707.) On the first and third Saturdays of the month is *Saturday Live*—concerts ranging from folk to classical, computer to clavichord. There's also an annual evening concert series; next year's program will feature music of George Washington's time. The Smithsonian Chamber Players, the resident ensemble, uses the historic instruments in concerts, many broadcast on Radio Smithsonian.

Sounds aside, the instruments are beautiful. The collection of more than 2,000 items—most not on display—ranges from a late 16th-century Italian virginal (a small harpsichord) to a guitar custom-built for country music singer Chet Atkins. A recent acquisition, the 1701 Servais violoncello (right) made by Antonio Stradivari, was donated by Charlotte V. Bergen. "Even the case is beautiful," said Cynthia Hoover. She stresses that the museum's collection, however, is not all "precious Western European." The current exhibit, "Tuning Up: American Fiddles and Bass Viols," features a heartwarming piece (right) by one George Jewett, 1794-95, who inscribed his cello with "Pamele" and a heart. No Stradivari, but it is, as the label so aptly says, a "labor of love."

Carol Simons

Typical of Civil War era are over-the-shoulder band instruments.

Crafted in Paris about 1825, this orchestral horn has no valves.

Stradivari violoncello was donated to Smithsonian in April.

New Englander George Jewett's folk cello was a "labor of love."

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Domestic Study Tours

Desolation and Gray Canyons September 30-October 11 or October 12-23: White-water trip for the adventurous; explore the geology, wildlife and exciting Indian and outlaw history of Utah's Green River.

San Francisco September 20-26: An in-depth view of the city's social and architectural history. Museum visits, bay cruise, evening events and concerts.

California Wine October 4-10: Visit selected vineyards for tasting and lectures with distinguished wine masters.

Great Smoky Mountains October 8-15: Camping, hiking and brilliant autumn colors enhance this spectacular natural history study adventure.

Asheville October 15-18: Visit Biltmore and other historic homes in this mountain resort area during the peak of fall foliage.

Gems Weekend October 16-18: The science and romance of gems and minerals with behind-the-scenes tours of the Smithsonian's renowned, glittering collections.

Florida Keys October 19-25: An active program of snorkeling, canoeing and swimming to study the ecology of Big Pine Key and colorful coral reefs.

Sapelo Island November 8-14: Camp on unblemished beaches while studying the marine ecology, Indian ruins and history of this Georgia barrier island.

Christmas at the Smithsonian December 4-6: Join curators and staff for behind-the-scenes tours of specially selected museums and our tenth annual tree-trimming gala.

Washington "Anytime" Weekend Choose any weekend to visit your choice of Smithsonian museums, spend two nights at Loew's L'Enfant Plaza Hotel or Hyatt Regency Washington, each close to the Mall, and see other sights in the city by Tourmobile. Reservations and payments at least ten days prior to arrival.

Foreign Study Tours

These tours range in size from small group experiences to charter adventures and vary in price from low cost to deluxe, depending on the type of travel, destination visited and length of trip:

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Oxford/Smithsonian Seminar September 11-26: Scientific Instruments and Historic Architecture are among ten in-depth courses taught by Oxford faculty. Live in Worcester College and visit Cambridge, Bath and Stratford for a performance.

The Ancient World of Peru September 18-October 2: Visit Lima and major archaeological sites along the coast; then explore the Inca capital of Cuzco, amazing Machu Picchu and colorful Indian markets.

Canadian Rockies September 22-30: Snow-capped peaks, lakes and forested valleys provide scenic grandeur for hiking and natural history study at Banff, Lake Louise and Jasper.

Salzburg Seminar October 3-18: Live in the 18th-century lakeside palace of Schloss Leopoldskron while studying the Baroque Era or the History of Opera. German lessons, museum visits, theater and concerts enhance plenary lectures in this setting of extraordinary beauty.

Portugal October 6-20: Explore Lisbon's fine museums and art collections before traveling to Alto Alentejo or Old Lusitania to see fortified hilltop cities, isolated castle towns, cathedrals and monasteries.

Kyoto Seminar November 6-22: A unique program to study Japanese culture and live in Japanese style. Scholars conduct seminars in art, history and introductory language lessons and lead field trips to the great temples, shrines and lovely gardens of Kyoto and Nara.

India Wildlife Safari November 16-December 11: Visit major wildlife sanctuaries to observe the magnificent animal life of the subcontinent. Travel to parks in Northern and Central India and Nepal's famous Tiger Tops. Includes Bombay, Delhi, Jaipur and Agra, site of the Taj Mahal.

Baroque Winter: Vienna, Salzburg, Munich January 3-17: The splendors of Central Europe in the new year with walking tours, museum lectures, opera and concerts in Vienna, Mozart's Salzburg, and the Bavarian capital. A special Smithsonian Viennese Ball is included.

Panama and the Spanish Main January 9-16: Experience the thrill of traveling from the Pacific to the Atlantic through the Panama Canal. Continue to the fascinating San Blas islands, then the Spanish Main bastion of Cartagena. Our chartered ship *Jason* also calls at Bonaire in the Dutch Antilles, the beautiful spice island of Grenada, and Barbados.

Mayan Mexico: The Yucatán Peninsula January 21-February 2 or February 10-22: The extraordinary ruins of the Yucatán in the company of an archaeologist—Uxmal, Palenque, Labná, Sayil, Kohunlich, Cobá, Tulum and Chichén Itzá.

Tall Ship Adventure February 12-21: Set sail on the luxurious 317-foot, four-masted sailing yacht *Sea Cloud* from Antigua to the Grenadines. Lectures and excursions enhance this fabulous sailing experience in the Caribbean.

Kenya January 28-February 14: Incomparable wildlife is observed in old safari tradition. Seminars in Nairobi, and in the field at Masai Mara, Samburu, Kilaguni. Meet local citizens and visit a school and handicraft center.

Red Sea Passage February 25-March 7: Sail from Suez on the *Argonaut*, visit Karnak, Luxor, Valley of the Kings, Abu Simbel in Egypt and Petra in Jordan. Tour the mosques and bazaars of Cairo, the Sphinx and pyramids at Giza. Optional Jerusalem prelude—February 18-26.

Zapotec and Mayan Mexico February 24-March 8 or March 17-29: Oaxaca and Zapotec sites of Monte Albán and Mitla; San Cristóbal de las Casas; Palenque, Uxmal and other Mayan ruins in the Yucatán.

Write National Associates, A&I 1278 Smithsonian Institution, Washington, D.C. 20560 or call (202) 357-2477 for specific tour brochures

in Washington

Selected Studies Seminars

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Genealogical Research October 4-9: Taught by Milton Rubincam, Marilyn Duncan and other leading authorities, participants learn how to conduct research in major genealogical repositories such as the National Archives, Library of Congress and DAR Library.

American Antique Furniture September 20-25: Connoisseurship of masterpieces, 1650-1840. Includes great collections, detection of fakes, care of antiques and tours of the elegant Diplomatic Reception Rooms at the Department of State and of Winterthur Museum.

Aircraft Restoration: How To October 4-8: The master craftsmen of the National Air and Space Museum share their many techniques in workshops at the Paul E. Garber Facility (formerly Silver Hill).

Tibet: Lost Horizons October 18-23: The culture, history and art of this rich civilization along with behind-the-scenes tours of the Freer Gallery and the best private Tibetan collection in the United States.

Post-Impressionist Masters March 7-12: Bill Kloss explores the outstanding paintings of artists such as Gauguin, van Gogh and Cézanne in lavishly illustrated lectures and tours of great museums.

Historic House Preservation November 1-6: Cosponsored with the Historic House Association of America, nationally known experts advise on all aspects of restoration and tour successful projects from lovely town houses to country estates.

World War II Aviation November 15-20: NASM's outstanding aeronautical staff and guest experts offer new insights into how the world's major air forces developed, and how quantum jumps in performance were achieved. Includes tours of many of the only surviving planes.

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©1981 SEBASTIANI VINEYARDS — A FAMILY WINERY IN THE SONOMA VALLEY

By William Weber Johnson

Bye-bye, Mom's apple pie; now it's chili that's in

The other day I attended a chili cookoff for the benefit of our symphony. I was also invited to one for the benefit of medical research, but didn't go.

In Beverly Hills the chef of a famous French restaurant was entertained at a party with "down-home American cooking" that featured "White House style authentic Texas chili."

A Los Angeles woman described as the poet laureate of an international chili society invited the public to bring aluminum cans, glass jars and scrap metal for recycling; in return she would sing, read poetry and serve some of her famous chili.

A West Coast editor-writer, in describing his mid-life crisis, told of a phase in which he and a wealthy Texas woman shared midnight snacks of Beluga caviar, Godiva chocolates—and chili made with armadillo meat.

The newspapers recently carried a picture of a young man wearing only a moustache, tattoos and a parachute pack, preparing for a nude sky dive in connection with a chili cookoff at a family nudist resort.

And so on. All of this is astonishing to one who used to eat a lot of chili but always did it furtively. My mother thought the chili parlor in Mattoon, Illinois, (small bowl a dime, large 15 cents) the moral equivalent of a pool hall. Besides, all those spices would destroy your insides.

There is nothing furtive about chili now. "A bowl of red" threatens to become the culinary symbol of America that apple pie once was. It has become not only socially acceptable but upwardly mobile.

After some years of working abroad I was reassigned to Texas and got reacquainted with chili. Major Robert Sprinkle Pool's chili joint was a gathering place for professional Texans and an entertaining source of unreliable information. In addition, my wife and I belonged to a small, purposeless and agenda-free group known simply as The Federation. Other members were E. DeGolyer, an erudite geophysicist who was also a formidable chili cook; Eugene McDermott, founder of Texas Instruments; Lon Tinkle, author and literary critic; and William Henderson Kittrell, nonstop raconteur. Whenever there was a notable in town—people like Clare Booth Luce, Tom Lea, Francis Henry Taylor or J. Frank Dobie—we would entertain them with chili, beer and freestyle conversation in the back room of the Royal Bar & Grill on Commerce Street in Dallas.

I also became friends with Wick Fowler, a widely traveled journalist who took chili ingredients to far corners of the world both to feed himself and amaze non-Texans. Wick later founded Caliente Chili, Inc. to market his packets of "2-Alarm" chili makings. When a customer complained he had found seven weevils in his packet, Wick apologized. There should have been 19; the missing dozen would be along shortly.

Basically, chili is a stew of coarsely ground or chopped meat, garlic, onions, cumin, oregano, masa flour and as much chili powder as the cook can stand. Beef is usually the meat. But innovators have used not only armadillo but rattlesnake, pork, chicken, goat, moose, bear, skunk, venison and earthworms. Yes, earthworms.

Chili probably originated in the Southwest as a simple food for trail drivers, cowboys and soldiers. Like many another workingman's dish, it has risen far above its beginnings. It is still available in modest eateries but it can also be had, for $10 a bowl, at elegant restaurants.

There are two "international" chili societies, fiercely competitive but equally devoted to the promotion of chili and chili cookoffs where amateur and professional cooks compete for prizes.

Two newspapers (one with the picturesque name of *Goat Gap Gazette*) chronicle the events of the chili world and its colorfully named characters such as Yeller Dog Marsh, Bad McFad, Allegani Janie and Ormley Gumfudgeon, who signs his letters "Warmly, Ormley."

There is a shelfful of books, the most readable and comprehensive being the recently published *Great American Chili Book*, by Bill Bridges.

Texans have a story about Sam Houston's first encounter with chili. Arriving there, Houston was taken to the home of a pioneer settler and offered a steamy bowl, red in color and spicy in aroma. Houston hungrily took a large spoonful. Then, eyes watering, he spat it out, and in his stentorian voice declaimed: "A lesser man would have swallowed the [expletive deleted] stuff!"

This is probably just one of many apocryphal stories about Houston. Historians dispute it on factual grounds. "Chiliheads" reject it for what they consider sounder reasons. Houston, they say, being the man of courage, wisdom and taste that he was, would have purely loved it.

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